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DECISION MAKING IN A PARTICIPATIVE BUDGETING CONTEXT: A
LABORATORY EXPERIMENT

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LEADERSHIP AND INFORMATIONAL INFLUENCES ON GROUP DECISION MAKING IN A PARTICIPATIVE BUDGETING CONTEXT: A LABORATORY EXPERIMENT

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CHAPTER I

INTRODUCTION

The setting of organizational goals is considered a key aspect of the managerial function. This decision process has been called "strategic planning" [Anthony, 1965a], and involves

> the process of deciding on objectives of the organi-
> zation, on changes in these objectives, on the
> resources used to attain these objectives, and on the
> policies that are to govern the acquisition, use, and
> disposition of these resources. [Anthony, 1965a, p. 16]

As goals are brought from the level of strategic planning to the level of "management control" (which Anthony [1965a, p. 17] describes as "the process by which managers assure that resources are obtained and used effectively and efficiently in the accomplishment of the organization's objectives"), relatively abstract goals must be reduced giving ever-increasing specification of particulars as one proceeds down the organizational hierarchy. This reduction process is one aspect of the budgeting function. The budget is the primary technique for the coordination of planned inflows (people, capital, and materials) and planned outflows (products, services, and social contributions) [Welsch, 1976]. The scope of the budgeting process may range from the development of a minimal quantitative expression of a plan of action to a comprehensive planning and control system. The latter might include the development and application of long-range enterprise objectives, long- and short-range profit plans detailed by responsibilities, and a

system of performance reports with appropriate follow-up procedures for investigating unexplained deviations [Welsch, 1976]. Regardless of the scope of the budgeting activity in any enterprise, the primary purpose of the budget is directing an organization toward its goals.

Organizations are not monolithic structures from which goal pronouncements automatically flow. Rather they consist of people, as individuals and groups, making goal decisions. The possibility of goal incongruity among individuals in organizations gives rise to the problem of goal setting and, analogously, budget development. However, it should be noted that goals set by the dominant coalition in an organization are usually termed "organizational goals" by theorists. The term organizational goals will be used here in than sense.

THE PROBLEM

It has long been recognized that individuals in their roles as employees have personal goals that may interface somewhat imperfectly with organizational goals and that such goal incongruity may politicize resource allocation. This can result in decision-making that may not be rational decision-making from the point of view of the firm. Employees acting "irrationally" (from this point of view) could simply be pursuing their own goals which may differ from organizational goals. Further complicating the situation is that not only may the organizational goals differ from individual goals, but individual goals may be altered temporally due to changes in the influences on such individuals.

To ameliorate this situation, Argyris [1952] called for
participative budgeting as a means of eliciting cooperation in
goal setting: by encouraging employees to participate in
budget formulation, the goals of the organization should tend
to be internalized so that organizational goals and employee
personal goals are more congruent. This joining of goals
enhances employee motivation to accomplish those goals they
helped formulate.

CONCEPTUAL DEVELOPMENT

Participation in goal setting takes a variety of forms.
At one extreme individuals may make decisions in a vacuum,
unaware of or disregarding the impact of their input into the
overall decision-making process (a molecular position). From
a behavioral viewpoint, this is poor participation due to the
lack of consideration for the interactive aspects of subsystems
contained within an organization. At the other extreme, the
organization could be thought of as an anthropomorphic being,
each subsystem functioning for the good of the whole (an
organismic position). This is also poor from a behavioral
point of view since the notion of complete goal congruency
(here, the "good" of the organization) may be naive.

Both extremes of the molecular-organismic continuum
offer a relatively weak promise for explaining behavior. As
a consequence, social scientists often study actions of
organizational subsystems which lie between the extremes. The
notion of a subsystem depends on a frame of reference. As
noted by Schein [1965, p. 67]:

> An organization divides up its ultimate task into
> subtasks which are assigned to various subunits.
> These subunits in turn may divide the task and pass
> it down further, until a level is reached where
> several people take a subgoal and divide it among
> themselves as individuals, but no longer create units.

Subsystems lie somewhere between the organization (organismic) level and the individual (molecular) level. A precise definition of a subsystem is not critical in this study. It is critical that members of a subsystem consider themselves as a group, defined as "a collection of individuals who have relations to one another that make them interdependent to some significant degree" [Cartwright and Zander, 1968, p. 46]. The interdependence of interest notion is based on the belief that the group is oriented toward developing group goals. Davis [1969] refers to this as a socio-group. If participative budgeting is viewed in this context, it is unrealistic to think of it at the extremes of a molecular-organismic continuum, but rather as a group process, however that group may be constructed.

Thus if all decisions are made in the context of an awareness of the subsystem in which the decision-maker operates, all decisions (including budgeting decisions) will be participative in nature. In a weak sense this is true. However, the degree of participation in the budget formulating process and the group responsible for making the decisions are more important. A superior could make unilateral decisions regarding the budget for his subordinates thinking of himself as a member of a group of other superiors. But the subordinates may not be co-opted into the organization and goal congruence may not be

facilitated. To achieve some degree of goal congruence, the decision process would have to be consensual in nature (not unilateral), and the group would have to be defined as the superior and his subordinates, not the superior and peer workers. If a consensual decision is desired, the group making such a decision will have to be somewhat formal in nature. That is, it would have to be able to meet as a group, share information, form opinions, and reach a consensus regarding the budget. The influence of information has been demonstrated in the psychology literature to have profound effects on group decisions [Lamm and Myers, 1978].

INFLUENCE OF INFORMATION

Information may be viewed as a change in the distribution of individuals' subjective probability over possible states of nature [Mock, 1971; Hirshleifer, 1973]. It has been normatively demonstrated to be valuable [Feltham, 1968, 1972; Mock, 1971]. If this is so, possession of information would be a desirable attribute. Individuals who possess information would be considered valuable by others and may play an important part in shaping group decisions.

If a group is composed of members of the same subsystem, their information is likely to be more homogeneous in nature than groups composed of members of differing subsystems. Thus the composition of a group may dictate the nature of the information shared by group members and possibly influence the decisions made by such groups. Since group composition may be an important consideration, it should be incorporated into

studies dealing with group decision-making.

To dichotomize, information can be distributed evenly or unevenly among group members. In an organizational setting, the even distribution of information is unlikely since, being a thing of value, it would be pursued and obtained by group members depending on ability and circumstances. The uneven distribution of information has made a strong impact on leadership theory.

LEADERSHIP

Shevitz [1955] demonstrated that possessors of information were perceived to be leaders by other group members. Being the possessor of information has been shown to stimulate the frequency of speaking by the possessor [Rudraswamy, 1964], and Jaffee and Lucas [1969] found that group members who speak more frequently are perceived as group leaders by others. Thus the influence of information on leadership should be examined when studying group processes.

IMPORTANCE OF THESE ISSUES

In order to evaluate the importance of these influences, it is necessary to determine if the distribution of information among group members is important from an accounting point of view. Empirically, this point cannot be resolved for two reasons. First, there is no current broadly-based evidence describing the budgeting process. Second, the few studies that do exist (most recently, Caplan and Champoux [1978]) do not address this variable. Hence the only basis, at this time, for

determining the importance of these influences as a substantive accounting issue is a priori thought.

A second question concerns whether or not a direct relationship exists between the amount of information and perception of leadership. This was studied by Shaw and Penrod [1962] and Shaw [1963]. They suggested that, given variable amounts of information, the informed group member was perceived more often as a leader if he possessed a small amount of information than if he possessed a large amount since the latter condition led to incredulity among uninformed group members. Additionally, too much information seemed to diminish the performance of the group-- the phenomenon of information overload [Dermer, 1973]. This study will provide the selected leader with a relatively small amount of additional information to avoid this problem.

THE CRITICAL ISSUE

It must be noted that although information and leadership may play important roles in budgeting and the development of goal congruency and motivation, they remain desirable by-products of the budgeting process. The prime objective of a budgeting system is the development of the budget itself. The budget should be consistent within the organization as a whole so that it functions as a coordinated plan, taking into consideration the interface between each organizational subsystem and the ultimate synthesis of these subsystems in moving the organization toward its goals. The critical issue is whether the concomitant goals of employee motivation and budgeting consistency are

attainable, and under what conditions they are more likely to be attained.

Writers on the subject have not associated the goal of employee motivation with the goal of budgeting consistency. Rather, technologically oriented researchers have concentrated on budget development methods while behaviorally oriented researchers have studied the behavioral implications of budgets. No one has studied the critical issue of the interrelation of budget development and behavior from a goal-oriented perspective.

GROUP POLARIZATION

As noted above, information has been shown to greatly influence decision making. Particularly, the theory of the influence of information strongly supports a phenomenon known as group polarization (GP). GP may be introduced by discussing two relevant concepts, group goal setting and group goal formulation.

Group Goal Setting

Cartwright and Zander [1968] summarized the formulation of group goals into two phases: (a) for a group to have goals, at least some of its members must possess a goal for the group, and (b) these goals for the group (of the individuals possessing them) have to be converted into group goals. Members of a group enter such groups with two types of motives: they tend to be person-oriented or group-oriented [Atkinson and Feather, 1966; Zander, 1968]. One orientation does not necessarily preclude the other. Person-orientation will lead to goals that benefit the individual, often at the expense of the group, whereas

group-orientation will lead to goals that may be beneficial to the group, perhaps at the expense of personal goals. These are the primary exogenous variables that identify the individual group goals which may be candidates for transformation into group goals.

Group Goal Formulation

One approach to goal-setting is to convert individual preferences to group preferences by a normative system. The works of Arrow [1963] and Luce and Raiffa [1957] are examples of this school. But this may not be descriptive of human performance [Anthony, 1965a] and indeed may not be possible. As Beaver and Demski note [1974, p. 175]:

> Arrow's impossibility theorem [sic] guarantees that restricting all preference relations to weak orders (without further restrictions) and imposing nondicta-torship, independence of irrelevant alternatives, and Pareto optimality conditions are mutually inconsistent conditions.

To fill the void, participation and power differentials among group members play a role in the formulation of group goals. Sometimes this is formalized (as in a legislative body), but often it is not.

Early research suggested that when one compared individual with group decisions, the alternatives selected by the group are often more risky than those of the individual members [Wallach, Kogan and Bem, 1962, 1964; Bem, Wallach and Kogan, 1965; Wallach and Kogan, 1965; Kogan and Wallach, 1967a; Vinokur, 1971]. This information was surprising in that conventional wisdom posited groups to be moderating decisional influences, and much of the appeal of the group decision rested

on the idea that social processes mollified extreme positions [Nagao, Vollrath and Davis, 1978]. However, people holding strong opinions on a subject examine evidence in a biased manner. They accept "confirming" evidence at face value while rejecting "disconfirming" evidence with a concomitant polarization in attitude. "Thus, the result of exposing contending factions in a social dispute to an identical body of relevant empirical evidence may not be a narrowing of disagreement but rather an increase in polarization" [Lord, Ross and Lepper, 1979, p. 2098].

Other research found contradictions in this "risky" shift. It was found that the direction of the shift depended on the nature of the problem under discussion and the norms of the group:

> There is . . . social support for the person who
> exercises caution or takes risks. The support,
> however, is related to the circumstances involved or
> specifically to the problem under discussion. The
> group's discussion of these varied circumstances would
> seem to allow the discussants to bring information to
> bear which supports the socially favored position.
> [Rabow, Fowler, Bradford, Hofeller and Shibuya, 1966,
> p. 25]

The general principle that allows prediction of a risky or conservative shift is initial prediscussion response: items which elicit risky shift have initial responses that tend to be riskier than those items on which conservative shifts are noted [Teger and Pruitt, 1967]. This high correlation of mean initial response and mean shift led to the reformulation of the risky shift to that of the "choice" shift, or as it is more popularly known, the group polarization hypothesis:

> The average postdiscussion response will tend to be
> more extreme in the same direction as the average of
> the pregroup responses. [Myers, in press]

RELATIONSHIP OF THE ISSUE TO THE STUDY

Group polarization may have an impact on budgeting in a participative setting. If members of a budgeting group are simultaneously members of a single subsystem, they may share similar goals from the point of view of the organization. It may be possible that the initial tendencies of the subsystem members will be similarly orientated facilitating polarization in a group situation. GP may not be necessarily unfavorable in a budgeting context, but it would be unfavorable if the resulting budget was not in accord with the requirement of budgeting consistency. Since GP tends to amplify extreme individual values, if a participative budgeting group initially favors a large or small amount in a budget, the group process may only increase or decrease, respectively, the initial tendency. This may be unfavorable in an interactive subsystem budgeting setting since the radicalization of the budget may make budgetary consistency across subsystems difficult. The possible conflict between these two goals is an important accounting issue (as would be any factor which may have a negative impact on the quality of budgeting).

In previous studies, GP has been examined generally in risk-taking situations and not usually in more general decision making settings. This study is the first application of this risk-related phenomenon to the more general decision making and budgeting literature. From an accounting point of view, it may

call into question the concurrent achievability of the goals of budgeting consistency and employee motivation.

CONSTRAINT ON ACCOUNTING APPLICABILITY

Studies in participative budgeting have yet to examine GP and leadership effects. The only accounting studies exploring GP have been risk oriented and set in an auditing context [Barrett and O'Malley, 1975; Reckers and Schultz, 1978; Schultz and Reckers, unpublished]. However, a limitation must be imposed in light of extant psychological research. GP has been shown to be strongest in relatively unlimited environments such as gambling decisions and attitude formation. If constraints were imposed, GP effects may be rather modest. Recognizing this possible limitation, this study explored budgeting processes applied to a rather unconstrained type of expenditure. If the expenditures involved are required by an organization to maintain operations on a day-to-day basis, there would be little possibility for divergence of opinion regarding outlays. Therefore, GP would rarely be present in developing budgets for short-run necessities. But this may not apply to budgets developed for items over which the organization has a great deal of long-run control. In accounting terms, these items are known as discretionary costs. "In formulating the budget for a discretionary [cost], management's principal task is to decide on the magnitude of the job that should be done" [Anthony and Dearden, 1976, p. 186].

For purposes of this research, a budget concerning research and development (R&D) and marketing (MKT) expenditures

is appropriate for two reasons. First, results of R&D and MKT expenditures are difficult to measure quantitatively. A simple mapping technique from expenditures to results would inhibit differences of opinion, a necessary condition for GP. Second, the goal congruence problem manifests itself in that R&D and MKT managers may want a research organization or marketing organization of greater quality than a firm can afford [Anthony and Dearden, 1976]. These ambiguities and potentials for conflict lend themselves to a condition favorable to the development of GP.

SUMMARY AND THESIS ORGANIZATION

In this introductory chapter, a review has been made of the problem of incompatibility of budgeting consistency with employee motivation that may develop because of the GP phenomenon. The purpose of this research is to detect and examine the implications of polarization in a participative budgeting context. To achieve this goal, an experiment was conducted to detect the presence of polarization in groups that also included the possibility for informational influence. The remainder of this thesis is devoted to explaining, describing and analyzing that experiment.

Chapter II consists of a review of the history of GP research, theoretical developments, and a model built on a synthesis of viable theories explaining GP. Chapter III discusses the general experimental design, variables, subjects, methodology and hypotheses. Chapter IV presents the empirical results while Chapter V discusses these results and their

implications for accounting research. The paper concludes with the limitations of the research.

CHAPTER II

THEORIES EXPLAINING GROUP POLARIZATION

Several theories have been offered explaining GP. Some
of them have been discarded and two are still viable. In this
chapter, the theories are presented and discussed. The latter
theories will be used to formulate a model which will generate
specific hypotheses to be tested in the experiment.

DISCARDED THEORETICAL EXPLANATIONS OF GP

Several theories, now superseded by others, were
proposed as explanations of GP. While each is no longer
considered adequate, they will be discussed (a) to give an
overview of past work in GP, and (b) to illustrate the progress
that has been made in research into group processes.

Theory of Emergent Leadership

Emergent leadership was one of the first explanations
suggested by social psychologists to explain GP [Marquis, 1962;
Collins and Guetzkow, 1964]. It was felt that in many groups,
someone emerges as the most forceful group member who could
sway the opinion of others. This extremity-influence hypothesis
held that greatest influence in a discussion was exerted by those
in a most extreme position since they were the most committed
[Castore and Roberts, 1972; Sherif, Sherif and Nebergall, 1965].
Later research found that the basic assumption of riskier
individuals emerging as leaders did not occur and that shifts
involving risky subjects did not result in significant increases
in shifts over control groups [Ellis, Spencer and Oldfield-Box,

1969; Myers and Murdoch, 1972]. Because of results such as these, emergent leadership has been discarded as an explanation of the GP hypothesis (e.g., Lamm and Myers [1978]).

Commitment Theory

A derivative of emergent leadership theory known as commitment theory hypothesizes that the discussion process engenders commitment on the part of the individual to the approach he has initially taken. "In the course of handling the information, as he [the participant] interacts with real or imaginary interlocutors, he chooses alternatives, binds himself to the choice, and thus commits himself to the work he is doing" [Moscovici and Zavalloni, 1969, p. 127]. This commitment moves the individual further in the direction he initially assumed, either toward risk or caution. However, the theory does not account for shifts after observation of group discussion or listening to recordings of discussions [Lamm, 1967; Kogan and Wallach, 1967b]. Commitment would be difficult to attribute to such passive subjects [Pruitt, 1971].

Theory of Social Decision Rules

A social decision rule (SDR) represents an accepted norm that specifies the weight individual positions should carry in determining the final group decision. Individual preference changes need not be assumed [Lamm and Myers, 1978]. The primary advocate of SDR is Davis [1973] who developed a general social decision scheme theory that explicitly sets forth the way

> individual preferences about a set of decision alter-
> natives defined by some task are resolved, combined,
> etc., to produce a group decision. More specifically,
> the general social decision scheme model is a trans-

formation of the probability distribution character-
izing individual preferences to a group distribution
over the same alternatives. [Davis, 1973, p. 122]

The mathematical exactitude of SDR was felt to make

possible more rigorous testing of psychological group processes.

The most popular SDR was majority rule [Burnstein, 1969;

Cartwright, 1971; Lamm, Trommsdorff and Rost-Schaude, 1973]

which predicts a shift toward the dominant pole when the majority

favors that direction and when there is skewness in the initial

choice distribution (which will often occur when the response

mean departs from the midpoint of the scale) [Myers and Lamm,

1976]. If the deviant minority in the tail of the distribution

is being pressured into conformity with the majority opinion, GP

would be a statistical artifact of the application of SDR [Myers

and Lamm, 1976; Myers, in press].

Despite its intuitive appeal, the theory of SDR has

not been supported by research for several reasons. First, group

medians have shifted as well as group means [Fraser, 1971; Myers

and Aronson, 1972]. "This is contrary to any model that depends

on skewness effects. For example, if the majority is really

unaffected by the group discussion, then the median group member

(who is one of the majority) should also be unaffected" [Myers

and Lamm, 1976, p. 612]. Second, group shift occurred in dyads

where there can be no skewness in the initial response [Baron,

Baron and Roper, 1974; Bateson, 1966; Lamm, Schaude and Tromms-

dorff, 1971; Myers and Aronson, 1972]. Not only majority rule

but "most of the available group decision schemes would not

predict effects in dyads" [Myers and Lamm, 1976, p. 612]. Third,

group shifts can occur without group convergence, without any diminution in variance of response which typically signifies a group decision [Myers, Bach and Schreiber, 1974]. Shifts without decisions, then, are possible-- a contradiction in terms of social decision rules. A final mark against SDR is a lack of falsifiability, since even after numerous scheme rejections it could be argued that the correct scheme has simply not been identified [Graesser, 1978]. For these reasons, SDR are not considered valid explanations of GP [Myers, in press].

Theory of Responsibility Dynamics

Responsibility dynamics refers to changes in levels of responsibility subjects feel for the decisions they make. Changes have been dichotomized into diffusion (decrease) and infusion (increase). Responsibility diffusion generally occurs when the object of the study is someone "outside" the group [Yinon, Jaffe and Feshbach, 1975]. This extends to physical and pecuniary harm: groups feel less responsible than the individuals that comprise the group about electrically shocking a subject [Wolosin, Sherman and Mynatt, 1975] or increasing monetary fines levied on a subject [Mathes and Kahn, 1975]. Note that these two items involved "losses" to the outsider: the responsibility diffusion trait was found to be generally true only with group membership and negative consequences.

> In a group situation one will tend to blame others
> for failure and diminish one's responsibility compared
> with that taken in an individual situation. However,
> when the outcomes are good, one doesn't diminish one's
> share of the credit-- one feels just as responsible
> for good outcomes when a member of a group as when alone.
> [Mynatt and Sherman, 1975, p. 1117]

However Baron and Sanders [1975] showed that responsibility diffusion occurred only when the decision involved someone outside the group but infusion occurred when the decision concerned an actual group member. In tests proposing donations to recognized charities, generous members decreased pledges when they met as a group-- the so-called "stingy" shift [Baron, Roper and Baron, 1974; Agha and Plott, 1977].

If the theory of responsibility dynamics were true, the above results would indicate that shifts were affective rather than cognitive because the outcome would be dependent on the test situation. Participants would change their attitudes only because of their association with the others involved. If an alternative group of subjects were in the experiment, attitudes may be different. However, a large body of research indicates that group-induced shifts persist for several weeks afterward [Wallach et al., 1962; Johnston, 1968; Marquis, 1962; Wallach and Kogan, 1965; Kogan and Wallach, 1967c; Lamm, 1967; Wallach, Kogan and Burt, 1968]. Cautious shifts are also unexplained by responsibility dynamics theory.

A second argument against the theory is that shifts have occurred in non-discussion situations where the treatment was the disclosure of others' decisions in written form [Clark and Willems, 1969; Teger and Pruitt, 1967]. If subjects did not engage in discussion, there would be little likelihood they would feel any responsibility for results since groups were only nominal.

Pluralistic Ignorance Theory

Pluralistic ignorance theory is based on a "conflict-compromise" process. The conflict is between what the individual values or desires and what he considers realistic or reasonable. If the "realistic" position is offered in group discussion, an individual may profess that position, feeling others believe the position. Thus the group as a whole may adopt a conclusion ignorant of the true feelings of the participants. The theory can be applied to the risky or cautious shift since subjects will shift to "acceptable" positions when they realize the extent to which others "share" this position [Pruitt, 1971]. This model assumed that people see themselves in a more favorable light than they do others. As such, it has been subsumed in social comparison theory which will be examined shortly.

Familiarization Theory

Bateson [1966] argued that group discussion generated familiarization with the issue under consideration, and such familiarization made discussants risk-prone since uncertainty was reduced. The theory was quickly discredited in that it failed to account for cautious shifts and did not explain shifts on non-risk dimensions [Pruitt, 1971]. Attempts at replication of the initial experiment failed [Bell and Jamieson, 1970; St. Jean, 1970; Fraser, 1971].

Summary

The above discussion demonstrates the progress GP research has made in questioning basic assumptions concerning underlying theory. Although these theories have intuitive appeal and do

help explain certain phenomena, they lack the breadth and power of the theories that are discussed next.

VIABLE THEORETICAL EXPLANATIONS OF GP

Currently, two theories are considered viable explanations of the GP phenomenon, social comparison and information influence. Each will be presented and will be used in predicting certain hypotheses concerning participative budgeting.

Theory of Social Comparison

Festinger's [1954] theory of social comparison holds that "social-influence processes and certain kinds of competitive behavior stem directly from a need for self-evaluation and the necessity for this evaluation to be based on comparisons with other persons" [Shaw and Costanzo, 1970, p. 277]. It is assumed that people generally perceive themselves possessing socially desirable attributes to a greater degree than the average person in their group. Consequently, people misjudge the position of others since the average person sees himself above average.

Risk-As-Value Theory. There are several versions of social comparison theory. The earliest is the risk-as-value theory [Brown, 1965] which regards riskiness as a culturally prescribed value that causes people to want to be at least as risky as others. The social comparison process manifests itself in that a subject will choose a risk level above what he perceives to be the group average. Group discussion leads to actual comparison [Pruitt, 1971]. When the subject finds he is not as far above average riskiness as he thought (since he underestimated

the average), he moves to an even more risky position. The theory is flexible enough to explain cautious shifts when people regard caution as valuable. Studies have found that such was the case when subjects assumed others to be more cautious on items involving risky shifts and more risky on items that demonstrated conservative shifts [Levinger and Schneider, 1969; Wallach and Wing, 1968].

In a study comparing social comparison theory with emergent leadership and responsibility dynamics theories, Vidmar [1970] supported the former when heterogeneous groups demonstrated greater shifts than did homogeneous groups. The greater the difference displayed in initial assessments, the larger the resultant shifts (a completely homogeneous group should display no shift since all group members would have the same value). Emergent leadership theory was discounted because in homogeneous low-risk groups, there existed no "risky" leader. Responsibility dynamics was discredited when it predicted no differences in shifts between homogeneous "medium" risk-takers and heterogeneous groups. These results were confirmed by Willems and Clark [1971]. Contrary evidence was demonstrated by Pruitt [1969] who found that individuals often valued caution over risk even on items on which they considered riskiness to be socially desirable.

Multiple-Values Theory. Stoner [1968] devised a multiple-values theory which sets differing values on specific items under consideration. It accommodates the Pruitt findings in that it does not assume risk is always socially desirous.

It merely does away with the value notion attributable to caution in the former theory [Pruitt, 1971]. Risky shifts are enhanced if subjects know about each others' relative standings on related attributes: "Whenever a person expresses an opinion on any issue, the meaning of that expression must be interpreted in terms of that person's identity and his standing on various related attributes" [Goethals and Zanna, 1979, p. 1474]. The shortcoming of this theory is that in order to predict the response, one would have to already know the pre-group individual tendencies and related attributes (either by results of previous research or by pre-tests, as did Stoner) since the direction of shift is situation specific. The theory simply restates the definition of GP given in Chapter I using different terminology.

Social-Comparison-of-Abilities Theory. This theory views risk taking as ability. Those who are more willing to take risks are viewed as possessing greater than average ability by others. This encourages risky behavior since people like to be thought of as superior to others [Codol, 1976].

> When a person learns that the level of risk he has
> initially chosen is at or below the group average, he
> has learned that he is defining himself as only as able
> as, or less able than, the other group members, and he
> will be motivated to be slightly better than the others.
> There appears to be two methods the individual could use
> to achieve this end: (a) he could attempt to lower the
> level of risk he thinks other group members would
> choose. In most of the risky-shift studies . . . it
> would appear that the individual ultimately uses the
> first method . . . . [Jellison and Riskind, 1970, p.
> 377]

Jellison and Arkin [1977] argue that this theory "would make the unique prediction that polarization would occur

<u>only</u> when extreme judgements were considered by others to indicate ability" (p. 247, emphasis supplied). Baron and Roper [1976, p. 521] summarize their study verifying the impact of external motivation in this manner:

> When subjects felt that larger estimates . . . denoted [external rewards], public (group) estimates were larger than preceding private (individual) estimates. In contrast, compromise (i.e., averaging) effects occurred in cells where subjects did not feel that deviation was an indicant of [external rewards].

Whether motivation is strictly external in this context has yet to be shown.

If the theory were true, the only necessary manipulation to produce shifts would be to have group members compare positions. Once participants found the true group average, they would shift in that direction so as not to appear lacking in ability. However, this does not account for shifts due to discussion when individual positions are not revealed [Eagly, 1974]. Perhaps they are inferred from discussion.

<u>Release Theory</u>. A fourth theory is release theory. This hypothesizes that some conflict is present in most decisions. It finds a cautious approach as compelling as a risky one since value is attached to reasonableness and moderation by those sensitive to the opinion of others (they do not want to appear to be "too extreme"). Risky shift occurs when a cautious group member finds another group member (the "trigger" person) who advocates risk. This releases the cautious individual from a conservative posture brought about by the assumed social constraint of conservatism.

Although the theory is attractive, it poses the problem

of explaining cautious shifts as the reverse of risky shift. Risky persons are released from their position by exposure to cautious ones, a reverse "Walter Mitty" effect-- awkward in interpretation [Pruitt, 1969]. Additionally, it assumes shifts to the most extreme position [Pruitt, 1971], not to the more easily demonstrable average position of risk.

Discussion. The point common to all social comparison theories is that mere exposure to others' responses is the necessary and sufficient condition for a shift. Teger and Pruitt [1967], Lamm [1967], Kogan and Wallach [1967b], Clark and Willems [1969], Bell and Jamieson [1970] and Dion, Baron and Miller [1970] address this issue. In a study by Myers et al. [1974], subjects polarized in non-conforming directions merely after being informed of the opinion of a control group. Researchers have confirmed this, finding significantly greater shifts on items where subjects had observed others' responses than on items where they had not, both in the laboratory [Myers, in press] and in natural settings [Myers, Wojcicki and Aardema, 1977]. Even if only opinion is involved and factual knowledge excluded, polarization occurs [Myers, 1977].

Concomitant with the work on social comparison models, researchers noted that GP was enhanced by the interchange of ideas among group members. It was found that although GP existed when groups were exposed to the opinions of others, groups that discussed the problem "significantly exceeded the [non-discussant] groups in extent of shift. We concluded that informational process alone could not fully account for the

risky-shift phenomena" [Kogan and Wallach, 1967b, p. 75].

Burnstein and Vinokur [1975, p. 412] integrate the two theories:

> Small shifts in choice occur even without discussion,
> when individuals merely know each other's preference.
> This appears to support an interpersonal comparison
> explanation of group induced shifts in choice and to
> refute explanations based on persuasive argumentation.
> [Evidence] demonstrates the contrary, that such effects
> are consistent with the persuasive-arguments formulation
> and are obtained under particular conditions specified
> only by the latter theory, to wit: Knowledge of other's
> choices is assumed to lead a person to think of reasons
> (arguments) others might have had for their choices--
> reasons which ordinarily would not come to mind without
> this knowledge. Such reasoning functions in the same
> way as persuasive argumentation during group discussion;
> it causes the person to persuade himself that an alterna-
> tive course of action now has greater merit than the one
> he initially preferred.

This introduces a second viable explanation of GP, the theory of
informational influence.

Theory of Influence of Information

The most strongly and consistently supported explanation
of GP is that of the influence of information [Lamm and Myers,
1978], also called the theory of relative arguments [St. Jean,
1970; Pruitt, 1971; Murnighan and Castore, 1975]. A special
meaning is attached to the term information influence: "cognitive
learning resulting from the emission and reception of cogent
arguments concerning the decisional issues" [Lamm and Myers,
1978, p. 164]. In the first thorough analysis of GP, Brown
[1965, p. 705] concluded that the group decision will be more
extreme than the individual decisions:

> The value engaged will influence the flow of information
> so that more relevant information will be elicited
> supporting the value than opposing it . . . . No single
> member of a group is likely to possess all the infor-
> mation that objectively bears on the discussion and so
> the discussion will give each one some new reasons for
> moving toward the value.

Myers and Lamm [1976, p. 616] define the theory in this manner:

> Discussion generates arguments predominantly favoring
> the initially preferred alternative, and for any given
> subject, some of these are likely to be persuasive new
> arguments. Thus, cognitive learning occurs mostly in
> the dominant direction and responses are modified
> accordingly.

It could be posited that arguments are confounded with speaker attitudes: an argument teaches a subject something he does not know (informational influence) while it conveys something about the opinion of the speaker (facilitating social comparison). Evidence indicates that if the position of the speaker is separated from his arguments, information does influence polarization [Eagly, 1974; Myers, Wong and Murdoch, 1971]. Arguments have a persuasive influence beyond the impression they convey about the speaker's position. Murnighan and Castore [1975] limited the possibility of social comparison by exposing subjects to two sets of arguments. "New information, whether it supports risk or caution and whether it is given for risk- or caution-oriented items, produces a shift in the direction of the information presented. Information that is not new does not produce a shift" [Murnighan and Castore, 1975, p. 173].

Kaplan and Miller [1977] verified this in a study in which they theorized that people have limited memories. Arguments heard last would be more salient than arguments heard earlier because the earlier arguments would be forgotten. Subjects individually listened to a tape recording of arguments supporting a point of view (the homogeneous condition). A second set of subjects also listened individually to tapes of the

same arguments, but each subject heard the arguments in a different order (the heterogeneous condition). It was hypothesized that, in a group meeting, the homogeneous subjects would remember and be able to present fewer arguments than the heterogeneous group since the former all heard the same arguments most recently (and forgot the same earlier arguments). The latter group would be able to recall and present more supporting arguments since each individual heard different arguments more recently. The result was a greater polarization by the heterogeneous group because of the increase in arguments at their disposal. Burnstein and Vinokur [1973] separated speaker attitudes and arguments by keeping subjects unaware of whether others were advocating their own position or role-playing. Informational influence was shown to be involved in shifts.

The theory is broken down into two components: (a) the conveyance of information, and (b) the argumentation process. Research has indicated that greater shifts are found when there is an interactive discussion of relevant issues than when passive receipt of arguments are presented. Bishop and Myers [1974] noted that the verbal exchange of arguments in a discussion produced significant response change while reading the agruments did not. St. Jean [1970] found that interactive discussion enhanced shifts, but groups were also affected by the nature of the information exchanged. Bell and Jamieson [1970] report that listening to arguments produced shifts (confirming Kogan and Wallach [1967b]) while reading them did not (although verbal discussion lead to even greater shifts).

Since spoken arguments merely reflect what average subjects already know, it seems unusual that verbalization should result in polarization greater than that produced by the knowledge alone. Three reasons explaining this have been proposed. First, arguments supporting the dominant tendency are more persuasive than opposite arguments [Vinokur and Burnstein, 1974, 1978; Lord et al., 1979]. Extreme arguments carry greater impact than neutral ones [Anderson and Graesser, 1976]. Second, polarization takes place during the discussion such that verbal arguments are more extreme than pre-discussion individual arguments. Judd [1975] found dominant arguments more prevalent in verbal exchanges than when written. Face-to-face exchange inhibits articulation of unpopular positions. Third, the simple repetition of shared information reinforces attitudes. Kaplan [1977] manipulated facts known to the group with the aid of bogus participants and found shifts away from initially preferred positions in jury decisions. Anderson and Graesser [1976] found the same polarizations in discussions about past presidents of the United States. Given the increasing rate of research into the influence of information in group discussion, other possible explanations probably will be developed.

Summary

Group dynamics play a part in the formulation of attitudes and responses; results are not just a simple pooling of individually processed information [Lamm and Myers, 1978; Myers, in press]. Social scientists find too much support for the theories of informational influence and social comparison to

dismiss either one. An example of this is Fazio's [1979] work on an informational social comparison notion which theorizes that one tries to obtain information (construction) or to confirm one's judgment by determining if that judgment derives from personal biases or qualities of the entity being judged (validation). He found that construction takes place only when the perceived level of information was low and available others might possess more information. However, if the subject's perceived level of information was high, validation motivation dominated. This work represents an integration of the theories into a hybrid. To see how they blend, a unifying conceptual model is necessary.

SYNTHESIS OF VIABLE THEORIES

Although both social comparison theory and informational influence theory have been demonstrated to be responsible for shifts in the laboratory ceteris paribus, variables cannot be held constant outside the laboratory. The two theories may actually be only one phenomenon, and the separation of different aspects may be a laboratory artifact. As research suggests, more than one process is evoked in most situations [Kogan and Wallach, 1967b; Burnstein and Vinokur, 1975; Fazio, 1979]. Informational influence is manifest when polarization occurs without accompanying attitudinal clues. A simple comparing of positions without interactive arguments also has demonstrated polarization, although some have felt biased cognitive processes are initiated upon exposure to others' opinions [Burnstein and Vinokur, 1975].

Exhibit 2-1 is a visual integration of the two theories. On many issues, individuals possess an ambivalent attitude [Festinger, 1957] and thus simultaneously can offer arguments which can be dichotomized as "supporting" and "attacking." If an individual is placed in a group, certain social dynamics begin to act upon him. Social comparison theory suggests that individuals desire to compare favorably to group members. To achieve this end, they offer only those arguments they feel will be acceptable to the group and suppress those arguments which they feel will not. The position of others can be determined in either of two ways. One, the individual can assume he knows how others feel on the issue. In this case, the individual will mentally filter his arguments before commencing, articulating only those arguments he feels are socially acceptable. Two, the individual can wait for the discussion to begin, offering his views only after others have presented theirs. The argument-filtration process will begin after the discussion starts. In either case, the filtering out of arguments attacking the assumed position of others will be done by the individual. This is not to suggest that all forms of behavior are covered by this integration of theories. It does indicate, however, that such other behavior has yet to be treated by psychological research in the present context.

A notable point is that this process is affective and not cognitive. That is, the individual could easily substitute articulated arguments depending on the assumed or actual position of others in the group. Arguments offered are situation specific and may not generalize over other group settings.

Informational Influence (cognitive

INDIVIDUAL

Arguments Supporting Position

Assumed Position of Others

Arguments Attacking Position

Articulated Arguments

POLARIZATION

Synergistic Effects

Social Comparison (affective)

OTHERS
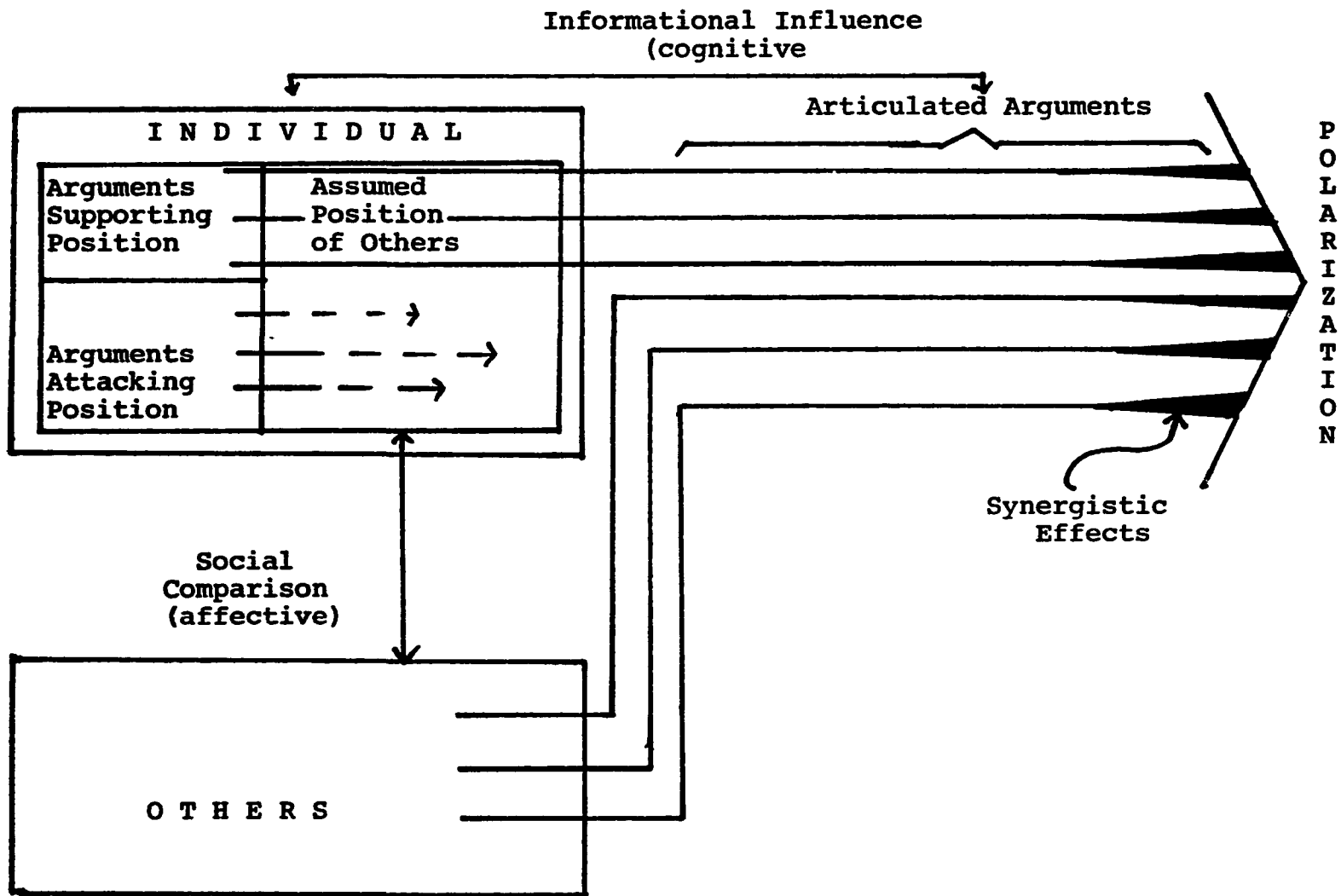
Exhibit 2-1
Polarization Model

The social comparison process leads to the offering of similar arguments by all group members. Since some of the arguments offered are new to any individual, his initial (albeit ambivalent) position is strengthened. Additionally, the influence of new information stimulates the individual into cognitively generating new arguments supporting the position.

In the process, the individual moves from an affective posture of embracing proferred arguments to a cognitive belief of what others say as correct (in accord with balance theory since he would want to believe others to whom he is attracted [Zajonc, 1960]). Moreover, this piling up of arguments has a synergistic effect on the group: the more the arguments favor one position over another, the more the group embraces the accepted position and rejects any alternative, a positive feedback mechanism. Thus the interaction of the cognitive changes brought about by the expression of favorable arguments and the affective changes caused by social motivation results in a synergistic effect on attitudes (represented by the growth in thickness of the arrows representing articulated arguments) manifesting polarization toward the extreme value.

SUMMARY

This chapter has presented a review of theories that attempt to explain the GP phenomenon. Although several have been rejected by social scientists, two remain fruitful sources of research and offer continuing promise in explaining group dynamics. These theories of social comparison and informational influence were discussed and synthesized into a conceptual model.

In the next chapter, the model will be used to hypothesize certain behavioral phenomena relevant to participative budgeting.

CHAPTER III

EXPERIMENTAL DESIGN, METHODOLOGY AND HYPOTHESES

Four objectives will be fulfilled by this chapter. One, the experimental design will be examined. Two, the suitability of the type of study and subjects will be discussed. Three, the metholology used in the study will be examined. Finally, the connection between participative budgeting and GP, examined in Chapter I, will be integrated with extant GP research reviewed in Chapter II to build hypotheses relevant to the budgeting process.

DESCRIPTION OF THE EXPERIMENT

The experiment used a scenario which can be found in Appendix A. The facts presented were freely adapted from the Westport Electric Corporation case [Anthony and Dearden, 1976]. In the first phase, the subjects were asked to indicate the amount they felt should be budgeted for R&D and MKT for each of the four projects described in the scenario. The second phase involved placing the subjects into groups according to a plan discussed under the headings "Group Composition" and "Leadership" below. In this part of the experiment, subjects were asked to come to a group decision on the same items they had seen in phase one. The final phase was a replication of the first with subjects again being required to respond on an individual basis to the four projects with proposed R&D and MKT budgets.

The matter of "optimal" group size has been studied,

but no conclusions have been reached. Researchers have found little significant relation between group size and number of ideas generated, difficulty in reaching consensus, and inter- action patterns. Generally, groups of size over seven encounter restraints against participation [Carter, Haythorn, Merrowitz and Lanzetta, 1951; Delbecq, 1968; Hackman and Vidmar, 1970; Holloman and Hendrich, 1971; Delbecq, Van de Ven and Gustafson, 1975]. A group size of three was selected as a convenient, manageable number. Five groups were used in each cell of the design.

Research Design

The research design used in the experiment is a completely crossed factorial analysis of variance (ANOVA) with repeated measures on the decision stage independent variable, described below.

Setting and Subjects

Because of the need to manipulate the independent variables and precisely control the environment in which this experiment was carried out, the laboratory experiment was selected as the method best suited to achieve these ends [Kaplan, 1964]. Additionally, the laboratory setting is preferred in this stage of research in GP since one of the purposes of such work is "the testing of predictions derived from theory, primarily, and other research, secondarily" [Kerlinger, 1973, p. 401].

The drawback in using an ANOVA design is the large number of subjects required. In this experiment, 144 subjects

were required for the experimental and control groups (discussed below). Natural subjects for this experiment are R&D and MKT personnel involved in participative budgeting. However, because of the need for a large number of subjects, students were used because of their availability and the logistical problems involved in finding suitable R&D and MKT personnel in sufficient numbers. To enhance the role-playing necessary when using surrogates, R&D personnel were science and engineering majors whereas MKT personnel were marketing and advertising majors. The use of students as surrogates for business people is a controversial issue that is still unresolved [Dickhaut, Livingstone and Watson, 1972].

EXPERIMENTAL VARIABLES

This research analyzed the effect of four independent variables on one dependent variable.

The Dependent Variable

The dependent variable is the proportion of expenditures proposed for R&D out of a total budget of R&D and MKT expenditures for each project. The proportion of expenditures would be of vital interest to many classes of budgetary participants because of the implication of the outlays on the goals of the organization as well as individual goals. A firm strongly committed to R&D would tend to attract R&D types, those individuals whose personal goals would be fulfilled at least in part by associating themselves with such an organization. Scientists, engineers and related fields may be considered R&D oriented.

On the other hand, individuals in other discretionary

cost areas may view strong R&D commitments with alarm since, in an organization with limited resources, funds spent on one type of discretionary cost may diminish funds available for other discretionary costs. Heavy R&D expenditures may conflict with their own personal goals which may rest in attenuating such outlays in favor of moving available resources into their areas. A second type of discretionary cost which meets the criteria of evaluation difficulty and goal incongruity is marketing. Those in the marketing area may fit the description of participants favoring heavy marketing outlays. Thus advertising and marketing students were used to emulate real world marketers in this study.

In this research, it is assumed that surrogated R&D types (science and engineering students) will favor heavier R&D budgets (relative to marketing), and that surrogated MKT types (advertising and marketing students) will favor heavier marketing budgets (relative to R&D).

The percentage of R&D costs was not directly elicited from the subjects but rather was determined indirectly by the experimenter based on data provided by subjects. The scenario asked for actual dollar expenditures for R&D and MKT for each of the four projects. The percentage was calculated from these numbers by dividing proposed R&D expenditures by the total of proposed R&D and MKT expenditures. This study is concerned with the proposed budget relative to alternative choices.

The data were also analyzed using two other dependent variables, dollars allocated to R&D and dollars allocated to MKT.

Analyses of variance revealed no differences when significance tests of the proportion variable were compared with these other variables. Therefore, analysis of the data in Chapter IV will be limited to a discussion of the proportion as the dependent variable which most fully captured the experimental effects.

The Independent Variables

Group Composition. In Chapter I it was noted that the composition of a group may dictate the nature of information shared by group members and possibly influence decisions. Particularly, many theories would predict that those in favor of increasing the R&D budget (R&D types) would generate arguments favoring their initially preferred alternative. The conceptual model presented in Chapter II would suggest that the reinforcing aspects of such arguments would tend to increase R&D budget proposals among R&D types. Similarly, those opposed to R&D increases, here MKT people, would generate arguments against R&D which would lead to proposals to reduce R&D expenditures or, alternatively, increase marketing expenditures.

To fine-tune these predictions, this study utilized four different group compositions as follows:

    Composition A1: three R&D subjects
    Composition A2: two R&D subjects, one MKT subject
    Composition A3: one R&D subject, two MKT subjects
    Composition A4: three MKT subjects

In Composition A1 groups, the initially preferred position would be for a greater proportion of expenditures in the R&D area than in MKT. The model suggests that arguments expressed in group meetings would be in favor of R&D and these reinforcing statements would result in shifts toward even greater R&D

expenditures. In A2 groups, the initially preferred position would not be as extreme as in A1 groups. The MKT person would probably attempt to diminish R&D expenditures to enhance the marketing budget by expressing arguments counter to those of the majority. A3 and A4 groups are mirror images of A2 and A1, respectively, and the arguments presented in the latter groups in favor of R&D would be presented in favor of MKT expenditures.

Given the implications of the influence of information, the following shifts are expected:

§ Composition A1: greatest shift toward increase in recommended R&D budget

§ Composition A2: moderate shift toward increase in recommended R&D budget

§ Composition A3: moderate shift toward decrease in recommended R&D budget

§ Composition A4: greatest shift toward decrease in recommended R&D budget

A1 and A4, consisting exclusively of R&D or MKT types, would manifest the greatest degree of GP, whereas A2 and A3 would polarize only moderately due to the presence of countervailing relevant arguments attenuating the GP effect. To strengthen the role-playing necessary in this experiment, the subjects were told that any funds allocated to R&D would result in a reduction in the marketing budget (see the scenario for details).

Leadership. The influence of leadership in a group setting was reviewed in Chapter I. As noted, possessors of information are often perceived as group leaders since they tend to speak more frequently [Rudraswamy, 1964]. The information-leadership-influence link is manipulated in this experiment

by varying the amount of information supplied to subjects. That is, in half of the groups, subjects (designated as leaders) were given additional information to determine whether the leadership function has an influence on GP. The information could be used by the leader in any manner deemed appropriate by him. To avoid the possibility of confounding effects, leadership was manipulated with the expectation that it would dampen rather than augment GP.

Thus in this experiment, two types of groups were used. The first type is leaderless groups, the second type (the leadership condition) includes one group member designated as leader. This designation was made after the initial phase of the experiment (see further discussion below in the "Decision Stage" variable section). The additional information concerned the recognition given by professional groups to the firm described in the scenario as well as R&D and MKT budgets of the firm for the past five years. Details can be found in Appendix B. The leader, if effective, should influence the decisions made by the group. As indicated, leaders were selected to increase the probability that they would offer arguments opposing the predicted polarization tendencies. Thus, in A1 groups, the leader was the R&D person individually favoring greatest MKT expenditures. In A2 groups, the leader was the single MKT person. In A3 groups, the leader was the single R&D person. Finally, in A4 groups the leader was the MKT person most strongly committed to R&D expenditures.

Decision Stage. This variable is necessary for the observation of any polarization in decisions. The initial

observation was made after the subjects read the scenario. They were asked to indicate a budgeted amount for R&D and MKT expenditures for each of the four projects (described below). After collecting the results, the experimenter calculated the percentage of expenditures indicated for R&D for each project. At this point, leaders were selected (for groups in the leader condition) according to the criteria noted above. This completed the "Individual" decision stage elicitation.

Next, subjects were assigned to A1, A2, A3 or A4 leader or leaderless groups. Group members were requested to arrive at a consensus figure, a figure derived unanimously, for proposed R&D and MKT expenditures for the identical scenario. Results of the individual phase were returned to the subjects to facilitate recall of their initial positions.

The final post-group phase consisted of a repetition of the initial individual phase. Subjects were again asked to indicate proposed R&D and MKT expenditures for each project on an individual basis. They were allowed to review their responses from the first two phases.

Projects. The final independent variable is the four items which comprise the projects on which the subjects were required to provide R&D and MKT budgets. The projects involved development of digital and analog home music systems, consumer electronic products, and personal computers. Detailed descriptions are in Appendix A. Each project was designed to elicit the same type of response from the subject. That is, items should not prejudice subjects toward one type of expenditure at

the expense of the others. This was verified in pilot studies where no significant difference across projects was detected ($F_{3,255}$ = .5017, p < .25). Risk was distributed evenly among the four projects by informing the subjects of the estimated risk involved. No effects were expected from this variable.

CONTROL GROUPS

Because of the numerous exposures of the subjects to the scenario, a possible bias could have resulted. The effect of testing was checked by using a control group not exposed to the initial individual stage. By limiting the elicitations to two, the biasing problem should be reduced. These results were compared to the suitable groups by means of Bonferroni t tests. Twenty-four additional subjects were used for the control groups, eight three-member groups to match with the eight conditions.

PILOT STUDIES

Two pilot studies using science and marketing majors at Illinois State University were carried out to refine the test instrument. None of the students involved in the first study were used in the second.

EXPERIMENTAL PROCEDURES

Students used in the actual experiment were under-graduate advertising, engineering, marketing and science majors from the University of Illinois at Urbana-Champaign. Solicitations for volunteers were made via sign on sheets across campus. The experiment took eight calendar days to complete.

The experimental groups used 120 subjects, while 24 were needed for control groups. There were ten sessions with between four and seven groups present depending on student availability.

Upon entering the laboratory, subjects were given the scenario. Identifying responses was facilitated by four-digit codes selected by the subjects early in the study. Subjects were instructed that this would assure anonymity and would be used only for matching one form with another. They were instructed to read the scenario and indicate the dollar amount they felt should be budgeted for R&D and MKT costs for each of the four projects. This phase lasted about 30 minutes.

All of the scenarios were then collected by the experimenter. For half of the subjects, a computation was made determining the percentage of funds proposed for R&D purposes. As noted under the "Leadership" section above, subjects that met the specifications were designated leaders for the group to which they were assigned. For example, for A2 groups (2 R&D subjects, 1 MKT subject), if a MKT person wished to allocate a smaller percentage of funds to R&D than two R&D people, he would be grouped with those two R&D people and would be designated leader. For the other half of the subjects, no calculation was performed by the experimenter. Rather, subjects were placed randomly into groups without leaders with the constraint that they fit one of the four group composition patterns.

After the researcher had completed assignment, the groups were announced by reading the four-digit codes determined by the subjects. The groups were asked to isolate themselves in the corners of a large laboratory to promote interchange of

information and to avoid interaction with other groups. For leaderless groups, a fresh scenario was provided and each individual's original scenario was returned. The group was asked to come to a consensual decision regarding the same information. Each individual was asked to list his four-digit number on the group scenario. For groups with leaders, the same procedure was followed. Additionally, the selected leader was privately provided with the "Additional Information" (Appendix B). He was instructed to use the information as he saw fit. With only a few exceptions, this phase took from 15 to 30 minutes to complete.

After this group phase was completed, subjects were asked to resume their original seats and a fresh scenario was again provided. Subjects were instructed to note for a third time the same information provided previously and to encode their four-digit number. Their original scenarios and the results of the group meeting were available to them in this third phase to facilitate recalling previous answers. This post-group phase took about five minutes to complete.

After finishing the third step, subjects were asked to turn in the entire set of scenarios to the researcher and to sign a form acknowledging receipt of $5.00 for participation in the experiment. While they did this, the researcher asked each subject what he felt the experiment was about to determine if demand characteristics may have contaminated the result. With the exception of two remarks about "group dynamics" which were considered too vague to disqualify the subjects, no

indication was made as to any intuition regarding the processes under investigation. Additionally, no subject acknowledged speaking with prior subjects regarding the nature of the experiment. Subjects were requested not to discuss the experiment with anyone and were dismissed.

Control groups were treated similarly except that they were not exposed to the individual stage. Rather, subjects were placed immediately in the group stage. Under the leadership condition, subjects were asked in which area should expenditures be greater (R&D or MKT) after reading the scenario to determine which individuals should be designated leaders.

HYPOTHESES

This section will discuss the main and interaction effects hypothesized in the order of an ANOVA table as follows:

Factor	Levels
A: group composition	A1: 3 R&D subjects
	A2: 2 R&D subjects, 1 MKT subject
	A3: 1 R&D subject, 2 MKT subjects
	A4: 3 MKT subjects
B: leadership	B1: leaderless
	B2: leader
C: decision stage	C1: individual
	C2: group
	C3: post-group
D: project	4 projects in the scenario

Main Effects

The group composition (A) effect is expected to be significant but this is merely an artifact of the design. Particularly, A1 groups should allocate a greater percentage of resources to R&D than A2 groups who should allocate more than

A3 groups who should allocate more than A4 groups. This expectation says nothing about polarization but does suggest that workers may have an interest in promoting the well-being of their subsystem as noted in Chapter I. Prior research [Simon, 1947; Dearborn and Simon, 1958] has indicated that subjects perceive what they are ready to perceive; the more complex or ambiguous the stimulus, the more the perception is determined by what is "in" the subject and the less by what is in the stimulus [Bruner, 1957].

The leadership (B) variable should not be significant because of the balanced nature of the experiment. Any increase in R&D for Al groups, for example, should be matched by a similar increase for MKT costs in A4 groups. The same parallel can be drawn for A2 and A3 groups. The leadership variable will enter into consideration in interaction effects discussed below.

Likewise the decision stage (C) main effect will not display significance for the same reason, the balanced nature of the experiment. Shifts in one direction will be offset by shifts in the opposite direction given group composition.

The project variable (D) should not be significant, as noted earlier. It is merely inserted to determine if there exists any interactions with other variables.

First-Order Interactions

The first interaction is that of group composition crossed with leadership (A x B). Because of the design of the experiment, it is expected that leadership will have a damping effect on polarization due to the nature of leaders selected.

If one compares leaderless and leader groups, the leader groups should be consistently more equitable in budgeting resources. On the other hand, groups without leaders should be more extreme in their judgments because of the GP phenomenon not being attenuated by leaders as the design would predict. This interaction does not indicate polarization which can only be seen across the decision stage variable. It does indicate the influence of leadership on the groups, however.

The second interaction is that of group composition crossed with decision stage (A x C). No hypothesized result is predicted concerning this since the composition variable consists of two types of groups, leader and non-leader. For leadership groups, shifts across decision stages could balance out as in the leadership main effect. Since this interaction is confounded, no meaningful predictions are feasible.

The leadership by decision stage interaction (B x C) is not expected to be significant because of the balanced nature of the experiment. Polarization in leaderless groups should be offset by damping effects on polarization in groups with leaders.

Second-Order Interaction

The most important effect under investigation is the triple interaction of group composition crossed with leadership crossed with decision stage, the A x B x C interaction. All of the forces at play in this experiment manifest themselves in this effect. Several hypotheses can be derived.

H-1: Polarization in the leaderless condition will be greater than polarization in the leader condition.

This hypothesis is based on the effectiveness of the counter-vailing arguments by leaders attenuating natural GP tendencies of leaderless groups.

    H-2: Leaderless groups should polarize toward initially favored positions.

Groups A1B1 and A2B1 should exhibit shifts toward increased R&D expenditures. Groups A3B1 and A4B1 should manifest shifts toward decreases in R&D expenditures (increases in MKT expenditures).

    H-3: Homogeneous leaderless groups should exhibit greater polarization than heterogeneous leaderless groups.

Homogeneous groups (A1B1 and A4B1) should shift more than heterogeneous groups (A2B1 and A3B1).

Groups with leaders are more difficult to predict. Depending on the effectiveness of leadership, differences across decision stages may or may not be significant. An effective leader may be able to offset any GP tendencies manifested by a leaderless group since the arguments he presents based on the additional information exclusively available to him may convince other group members that their inclinations toward greater concentrations of expenditures in one area are incorrect.

    H-4: Homogeneous leader groups should exhibit less polarization than homogeneous nonleader groups.

Since the leader in heterogeneous leader groups actually is MKT oriented (in A2B2 groups) or R&D oriented (in A3B2 groups), he may exhibit greater conviction in his beliefs than leaders in homogeneous groups resulting in greater polarization for heterogeneous groups.

Other Hypothesis

H-5:   The variance of budgeted amounts should be less in
       the post-group stage than in the individual stage.

This would be a manifestation of the cognitive change resulting

from the consensus decision derived in the group stage. If the

change were only due to compliance of individuals with the group

[Kelman, 1958], the original diversity of opinion present in

the individual stage would also be present in the post-group

stage. As noted in the model developed in Chapter II, initial

ambivalent attitudes held by individuals are crystallized

during group discussion into acceptance of the group position.

Therefore the variance in values assigned to the four projects

should be less in the post-group stage than in the individual

stage.

SUMMARY OF HYPOTHESES

A list of the hypotheses tested in this experiment

is as follows:

H-1:   Polarization in the leaderless condition will be
       greater than polarization in the leader condition.

H-2:   Leaderless groups should polarize towards initially
       favored positions.

H-3:   Homogeneous leaderless groups should exhibit greater
       polarization than heterogeneous leaderless groups.

H-4:   Homogeneous leader groups should exhibit less polariza-
       tion   than homogeneous nonleader groups.

H-5:   The variance of budgeted amounts should be less in
       the post-group stage than in the individual stage.

CHAPTER IV

EMPIRICAL RESULTS

CONTROL GROUPS

Control groups of three subjects each were exposed to the eight treatment conditions (four types of composition by two leadership conditions) for a total of eight groups. They were given only the group and post-group decision stages to test for fatigue on the part of the experimental groups due to the three repeated exposures to the scenario and its concomitant decisions. Since Dunn's multiple comparison procedure (also called the Bonferroni $\underline{t}$ statistic) can be used for making all planned comparisons among means [Kirk, 1968], it was used to compare group and post-group response in all eight treatment conditions. Group response ($\underline{t}_7 = 1.819$) and post-group response ($\underline{t}_7 = 2.217$) were not significant at the five percent level.

SUMMARY TABLE

Exhibit 4-1 presents the ANOVA summary table for all effects in the experiment.

SIGNIFICANT SECOND-ORDER INTERACTION

The most informative of all interactions is the A x B x C (group composition by leadership by decision stage), significant at the .000 level ($\underline{F}_{6,224} = 7.3852$). In the next chapter this interaction will be utilized to discuss the polarization hypotheses (H-1 through H-4) developed in Chapter

Exhibit 4-1

ANOVA Summary Table

Factor	df	F Ratio	Probability
A	3,112	86.3107	.000
B	1,112	.0394	.843
C	2,224	.9350	.394
D	3,336	.7809	.505
A x B	3,112	6.8276	.000
A x C	6,224	1.1550	.332
A x D	9,336	5.2626	.000
B x C	2,224	1.2487	.289
B x D	3,336	2.0743	.045
C x D	6,672	.9771	.440
A x B x C	6,224	7.3852	.000
A x B x D	9,336	1.5429	.132
A x C x D	18,672	.5211	.949
B x C x D	6,672	.8930	.499
A x B x C x D	18,672	.5549	.931

A = group composition
    A1: 3 R&D subjects
    A2: 2 R&D subjects, 1 MKT subject
    A3: 1 R&D subject, 2 MKT subjects
    A4: 3 MKT subjects

B = leadership
    B1: leaderless
    B2: leader

C = decision stage
    C1: individual
    C2: group
    C3: post-group

D = project (4 projects in the scenario, D1 through D4)

III. The A x C interaction at the two stages of leadership most clearly relates the influences present here. Exhibit 4-2 indicates the allocation to R&D in each condition while Exhibit 4-3 is a graphic representation of this data.

The leadership manipulation was checked by means of Dunn's multiple comparison procedures. The percentage allocated to R&D for designated leaders was compared to the percentage of

Exhibit 4-2

**R&D Allocations by Group Composition and
Decision Stage in Two Leadership Conditions**

		C1	C2	C3
B1:	A1	58.6	59.9	58.8
Leader-	A2	54.2	58.9	56.4
less	A3	47.7	43.0	44.8
	A4	45.0	38.7	39.2
B2:	A1	59.2	60.6	60.3
Leader	A2	52.8	47.2	51.0
	A3	47.0	49.9	47.6
	A4	42.7	45.4	42.9

Exhibit 4-3

**Illustration of Interaction of Group Composition and
Decision Stage at Two Leadership Conditions**

B1:   Leaderless
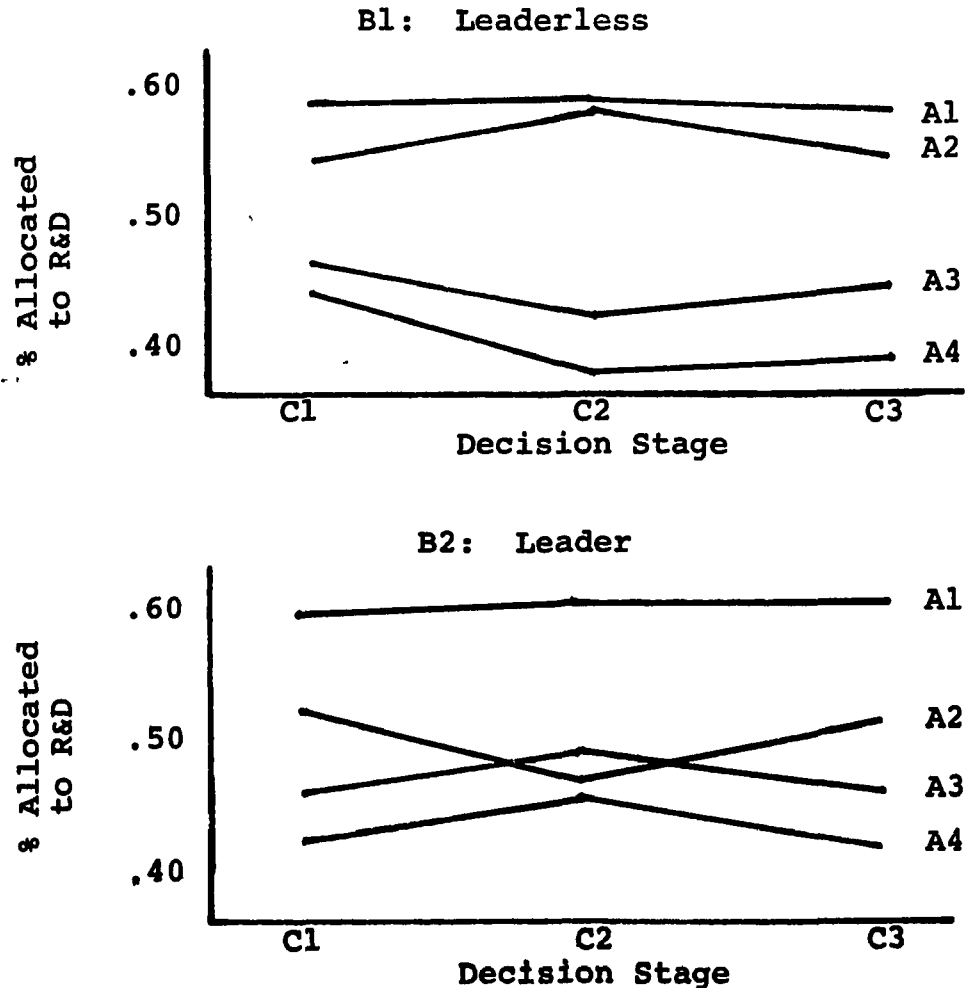
B2:   Leader

the other members of each group. Differences were significant in each case at the five percent level.

The simple interaction of group composition by decision stage in the leaderless condition was significant at the .01 level $(F_{6,224} = 2.854)$, while in the leader condition it was significant at the .005 level $(F_{6,224} = 3.411)$.

The simple interaction of group composition by leadership in the individual decision stage was not significant $(F_{3,224} = .601)$, whereas it was significant at the group stage $(F_{3,224} = 29.172, p < .000)$ and the post-group stage $(F_{3,224} = 6.607, p < .001)$. This simple interaction was examined by means of the simple effects of decision stage over the eight treatment conditions. Exhibit 4-4 details the results of these tests.

Exhibit 4-4

Simple Decision Stage Effects for
Group Composition by Leadership Condition

	B1: Leaderless F Ratio[a]	B2: Leader F Ratio[a]
A1	.3828	.4687
A2	4.2661*	6.2771**
A3	4.4577*	1.8191
A4	9.4038***	1.7941

*p < .025   [a]2,224 df
**p < .005
***p < .001

However, since the decision stage effect consists of three levels, greater insight can be gained by testing the pairwise comparisons of the individual-group and individual-post-group decisions. Exhibit 4-5 shows the results of Newman-Keuls tests

for each treatment.

Exhibit 4-5

Comparison of Changes in R&D Allocation of Group Compositions
by Leadership Effects Across Two Decision Stages

			Cl v. C2	Cl v. C3
Bl:	Leaderless	Al	1.3	0.2
		A2	4.7*	2.2
		A3	-4.8*	-2.9
		A4	-6.3**	-5.8**
B2:	Leader	Al	1.5	1.1
		A2	-5.6**	-1.8
		A3	2.9	0.6
		A4	2.7	0.2

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

COMPARISON OF SECOND-ORDER INTERACTION WITH HYPOTHESES

Exhibit 4-6 summarizes the strength and direction of

shifts between the individual and group response phases.

Exhibit 4-6

Comparison of Hypothesized with Actual Results Between
Individual and Group Decision Stages Along
Direction and Strength Dimensions

| Composition | Leaderless | | Leader |
	Hypothesis	Change	Change
Al	Strong increase	+1.3	+1.5
A2	Weak increase	+4.7*	-5.6**
A3	Weak decrease	-4.8*	+2.9
A4	Strong decrease	-6.3**	+2.7

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

Positive numbers represent percentage increases in proposed R&D

budgets while negative numbers denote decreases. An examination

of the leaderless condition shows that all shifts were in the hypothesized direction. With the exception of the all-R&D groups, the strengths of the shifts were as predicted. A Newman-Keuls test yielded significant differences among all shifts at the .05 level except the two MKT-dominated groups (A3B1 and A4B1). For groups with leaders, a Newman-Keuls test indicated significance at the .01 level in pairwise comparisons between the A1B2-A2B2, A2B2-A3B2 and A2B2-A4B2 combinations.

OTHER HYPOTHESIZED RESULT

The final hypothesis discussed in Chapter III related to an expected decrease in the variability of elicitations when the individual and post-group phases of the experiment are compared. Exhibit 4-7 compares the standard deviation of the independent variables for each of the eight treatment levels. Notice that this table represents a collapsing across the project variable.

Exhibit 4-7

Comparison of Standard Deviations of Responses in
Each of Eight Treatment Conditions Between
Individual and Post-Group Conditions

	A1		A2		A3		A4	
	B1	B2	B1	B2	B1	B2	B1	B2
C1	.139	.236	.203	.228	.254	.256	.160	.215
C3	.118	.209	.212	.179	.216	.200	.146	.164
Differ-ence	-.021	-.027	.009	-.049	-.038	-.056	-.014	-.051

Statistically, the null hypothesis of equality of shifts was rejected at the .01 level using the Wilcoxon Matched-Pairs

Signed-Ranks test, or the .008 level using the Walsch Test
[Siegel, 1956].

OTHER FINDINGS

Of lesser importance are the remaining findings shown
in Exhibit 4-1.

Main Effects

The group composition effect was significant showing
successful manipulation of the subjects. Different types
of groups did allocate significantly different proportions of
the proposed budget to R&D. The mean percentage allocated to
R&D decreased as one moves from R&D-dominated groups (A1)
toward MKT-dominated groups (A4). Moreover, a Newman-Keuls
multiple comparison test showed all composition types to be
significantly different from each other at the .01 level.
Proportions allocated to R&D for the four group types were:
A1, 59.5 percent; A2, 53.4 percent; A3, 46.7 percent; A4,
42.3 percent.

The main effects for leadership, decision stage and
projects were not significant as expected.

Significant First-Order Group Composition Interactions

Exhibit 4-1 indicates a significant ($p < .000$) A x B
interaction, group composition crossed with leadership effects.
An A x B summary table (Exhibit 4-8) displays the results.
This information is graphically depicted in Exhibit 4-9.

Simple effects tests of the leaderless condition ($F_{3,112} =$
58.119, $p < .000$) and leader condition ($F_{3,112} = 36.296$,

Exhibit 4-8

Interactive Effects on R&D Allocations of
Group Composition and Leadership

			B1: Leaderless	B2: Leader
A1:	3 R&D		59.1	60.0
A2:	2 R&D, 1 MKT		56.5	50.4
A3:	1 R&D, 2 MKT		45.2	48.2
A4:	3 MKT		41.0	43.7

Exhibit 4-9

Illustration of Interactive Effects on R&D Allocations
of Group Composition and Leadership
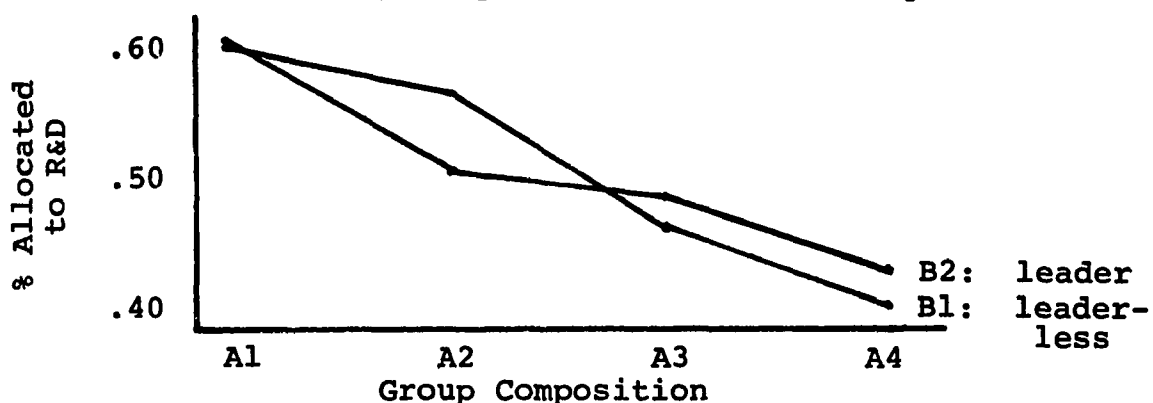
$p < .000$) indicate significant differences across the various group composition types. This is in agreement with the significant A effect. A Newman-Keuls comparison among composition types in the leaderless condition in Exhibit 4-10 shows significant differences among all group compositions except for A1 and A2, the exclusively- and predominantly-R&D oriented groups.

Exhibit 4-11, a Newman-Keuls comparison of group compositions in the leader condition, shows significant differences except between A2 and A3 groups-- those groups composed of mixed R&D and MKT membership. In the case of

Exhibit 4-10

Multiple Comparisons of Differences Among Group
Compositions in the Leaderless Condition

	A2	A3	A4
A1	2.6	13.9**	18.1**
A2		11.3**	15.5**
A3			4.2*

*p < .05
**p < .01

Exhibit 4-11

Multiple Comparisons of Differences Among
Group Compositions in the Leader Condition

	A2	A3	A4
A1	9.7*	11.9*	16.4*
A2		2.2	6.7*
A3			4.5*

*p < .01

heterogeneous groups, the leadership effect was strong enough
to make differences non-significant. As can be seen from
Exhibits 4-8 and 4-9, except in all R&D groups (A1), leader-
ship attenuated the GP phenomenon since allocations were close
to the 50 percent mean in the leader condition compared to the
leaderless condition. The triple interaction discussion above
noted details.

Examining the leadership treatment across the four
group composition types revealed differences as illustrated in
Exhibit 4-9. At the A1 level (all R&D groups), leadership
had no effect ($F_{1,112}$ = .3514, not significant). On the
other hand, leadership was significant at the A2 level (2 R&D,
1 MKT) with an $F_{1,112}$ of 14.237 (p < .001) and in the predicted

direction. For A3 groups (1 R&D, 2 MKT), the shift was significant at the .06 level ($\underline{F}_{1,112}$ = 3.432). Again the shift was in the anticipated direction toward R&D. Exclusive MKT groups (A4) displayed an expected shift toward R&D expenditures significant at the .10 level ($\underline{F}_{1,112}$ = 2.821).

The significant A x D interaction, composition by project ($\underline{F}_{9,336}$ = 5.2626, $\underline{p}$ < .000), warrants comment. Simple group composition effects (A) for each project revealed significant differences. That is, each type of group allocated significantly different proportions of budgeted funds to each project in the scenario. This agrees with the A main effect manipulation check. Exhibit 4-12 shows means for each item by group type together with $\underline{F}$ ratios and probabilities.

Exhibit 4-12

Proportion of Budget Allocated to R&D by Group Type
by Project and Related Significance Levels

	D1	D2	D3	D4
A1	59.5	62.5	61.1	55.1
A2	54.6	52.5	53.4	53.2
A3	46.6	45.7	47.1	47.3
A4	42.0	40.2	42.4	44.7
$\underline{F}$ Ratio[a]	67.609	100.928	71.843	25.572
$\underline{p}$ <	.000	.000	.000	.000

[a]3,336 $\underline{df}$

Newman-Keuls tests by project revealed significant differences for all pair-wise comparisons ($\underline{p}$ < .01) except for A1D4-A2D4 and A3D4-A4D4 pairs.

The simple effects test for each project across group type revealed some discrimination among projects for A1 and A4

groups as shown in Exhibit 4-13, graphically illustrated in Exhibit 4-14. Although it is desirable that items elicit no

Exhibit 4-13

Simple Effects of Projects for Each Group Type

	F Ratio[a]	Probability
A1	11.414	.001
A2	.860	not significant
A3	.573	not significant
A4	3.866	.010

[a] 3,336 df

Exhibit 4-14

Illustration of Interactive Effect on R&D Allocations
of Projects by Group Composition
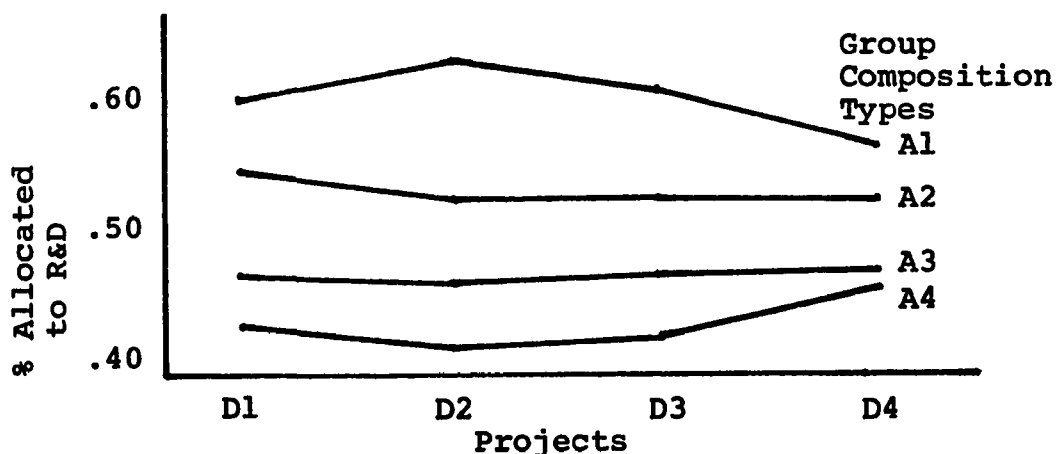
discrimination among group types, the effect is not damaging in that project effects were not important in the interactions of interest in this study.

Other Significant Interaction

The final significant factor shown in Exhibit 4-1 involved the B x D effect. This showed that leadership and

project unexpectedly interacted with each other. Exhibit 4-15 shows mean allocations to R&D in each of the eight conditions.

Exhibit 4-15

Proportion of Budget Allocated to R&D by Leader Type
by Item and Related Significance Levels

	D1	D2	D3	D4
B1	50.1	49.3	51.4	50.9
B2	51.3	51.1	50.6	49.3
F Ratio[a]	1.622	3.300*	2.825*	1.783

*$p < .10$ [a]1,336 df

Although D2 and D3 did cause discrimination between leaderless (B1) and leader (B2) groups, the significance is not over-whelming. Moreover, when the simple effect of leadership types across items were computed, they were not significant ($F_{3,336} = 1.783$ for B1; $F_{3,336} = 1.804$ for B2).

CHAPTER V

DISCUSSION, IMPLICATIONS AND LIMITATIONS

Chapter IV contains the statistical results of the
experiment. In this chapter, a discussion is presented of
those results and the broader implications for accounting
research. The chapter concludes with the limitations of the
study.

DISCUSSION OF PRINCIPAL FINDINGS

The principal area of investigation in this research
involved the influence of leadership on polarization. This
study tested whether leadership might reduce GP. As shown in
Exhibits 4-8 and 4-9, groups with leaders tended to take less
extreme positions than did leaderless groups except for all-
R&D (Al) groups. It was expected that all shifts would be
toward greater equality in allocations between R&D and MKT
expenditures. For Al groups, instead of the anticipated
decrease, Exhibit 4-8 shows almost no difference in R&D
expenditures (59.1 to 60.0 percent). R&D leaders (the R&D
persons most in favor of MKT expenditures at the individual
stage) did not manifest commitment to their initial position
and joined with other group members in allocating more funds
to R&D, albeit not significantly. This lack of leadership
effect on Al groups will be noted repeatedly in this discus-
sion. As pointed out in Chapter IV, a manipulation check on
leadership showed leaders to be significantly different than
their respective group members at the .05 level. The phenomenon

is unexplained. In all other cases, allocations were as
hypothesized.

These allocations are across all decision stages and
say nothing about polarization. To investigate the polariza-
tion hypotheses, the triple interaction effect was reviewed
in Chapter IV.

H-1: Polarization in the leaderless condition will be
      greater than polarization in the leader condition.

Exhibit 4-5 demonstrates that such was the case. In
the leaderless condition, three of the four group types polar-
ized significantly between the individual and group stages
(again, the Al group was the exception). Only one of the
leader groups polarized significantly between these two stages.

However, Exhibit 4-5 also indicates that although group
polarization was manifest in four of the eight conditions
overall, individuals drifted back to their original positions
resulting in only one polarization in the post-group stage.
The analysis of this outcome and its implications are deferred
until a review of all hypotheses has been completed.

H-2: Leaderless groups should polarize toward initially
      favored positions.

H-3: Homogeneous leaderless groups should exhibit greater
      polarization than heterogeneous leaderless groups.

In every instance, leaderless groups demonstrated the
hypothesized behavior as seen in Exhibit 4-5. Again with the
exception of the Al group, all polarizations were significant.
Additionally, the strength of polarization of the homogeneous
group that demonstrated significant shift was greater than the
heterogeneous groups. The Al group proved the exception once

more.

The unanticipated behavior of the A1 group can best be seen in Exhibit 4-3. In both the leaderless and leader conditions, all responses remained about the 60 percent level which suggested the possibility of a ceiling effect. However, the scenario offered a maximum allowable allocation to R&D (or MKT) of 80 percent. Thus the upper limit may be a self-imposed limitation on the part of the subjects. This could be taken as a sign of maturity on the part of all subjects (note that the MKT subjects imposed about the same limitation) since the projects in the scenario implicitly required both types of expenditures to achieve success. Too great a divergence may have proved unprofitable in the long run.

H-4: Homogeneous leader groups should exhibit less polarization than homogeneous nonleader groups.

Homogeneous leader groups manifested no significant polarization demonstrating the effects of leadership. It should also be noted that the leadership effect was powerful enough to reverse the direction in the A2 groups from +4.7 percent in the leaderless condition to -5.6 percent in the leader condition.

H-5: The variance of budgeted amounts should be less in the post-group stage than in the individual stage.

This hypothesis was expected to result from a crystallization of opinion due to group processes discussed in Chapter II. Exhibit 4-7 illustrates that only one of the differences (A2B1) was not negative and that that difference is the smallest change noted.

Although most of the polarization hypotheses were

supported by the evidence of the research as seen in Exhibit
4-5, it should be noted that polarization was internalized only
in the all-MKT leaderless groups (A4B1) since it was the only
composition that displayed polarization in the post-group
decision stage. All other polarizations indicate compliance
on the part of the subjects in group settings with reversion
to original positions thereafter. Most GP research concentrates
on the individual versus post-group stages while this work
treated the individual versus group decisions as the change of
primary importance. This shift in emphasis was made since a
participative budget would be developed in the group, not
post-group, decision stage. The implications of polarization
as mere compliance by most group members has implications for
accounting research.

IMPLICATIONS FOR ACCOUNTING RESEARCH

The task assigned the subjects in this research was on
developing a small part of a budget. As noted in Chapter I,
the budget is the primary accounting technique for the
coordination of planned inflows and outflows in an organization.
Since one of the inflows includes the people that make up the
organization, the budget has behavioral implications.

One of the purposes of participative budgeting is
eliciting information that may be held at lower levels in the
organization. A budget formulated exclusively by higher-
level management ignores the fact that information may be
located at varying organizational levels. The top management
group is dependent on information supplied to it [Field, 1969],

and to ignore untapped insights may lead to unfounded assumptions of fact or diminution of potential. As shown in the model developed in Chapter II, information elicitation is engendered by group processes. Thus participative budgeting utilizing properly constructed groups (defined in Chapter I) encourages the development and sharing of information necessary for a meaningful budgeting system.

However, the conceptual model also notes that these same group processes may lead to inhibiting information that may be considered contrary to an assumed position of the group. This may result in such problems that have been previously discussed. Additionally, the problem is complicated by the fact that budgets differ in purpose. As noted in Chapter I, Anthony [1965a] has broken down the process into two steps, strategic planning and management control. Whereas the purpose of strategic planning is to show expected results, the purpose of management control is to lead to desired results [Anthony, 1965b]. That is, the formal guidelines (budget) of the former are designed to show best estimates of the future, while the budget of the latter is motivational in intent. As Bedford [1963] indicated, accounting is not neutral to purpose. As such, the accounting function (more specifically-- budgeting, more generally-- record-keeping) in the organization becomes extremely powerful. In terms of Weick [1969], "The crucial decisions are those that pertain to information stored in the retention process [one of which is accounting]. Even though these latter decisions may be made at 'lower' levels in the

organization, they remain the most crucial ones" (p. 101).

Another thrust of this research addresses some aspects of the goal formulation process. The evidence of this study supports the notion that a budget, although formulated by a group, may not be internalized by that group. While acccunting researchers have investigated several of the same aspects as this study, their research has not questioned the acceptance by the subjects of the structural situation. For example, two studies of the same data by Hopwood [1972, 1974] examined the role of budgeting and leadership in performance evaluation without questioning the internalization of the budget or the leadership climate by subordinates. While this avenue of research is valid, it cannot be substituted for participative budgeting research since the situations differ. In Hopwood's work, the leaders and budgets are tacitly accepted as faits accomplis, whereas in this work both are products of the group process. Rather, these studies can be used to gain insight into processes that may take place in a participative setting.

Another area of study in a participative setting is that of the principle of feedback, information regarding the extent to which goals have been achieved. For example, Mock [1973] has shown that feedback contributes to learning. Cook [1967] found frequency of feedback affected satisfaction and interest. Sorenson and Franks [1972] found that accounting-type feedback decreases differences between expected and actual performance, while Foran and DeCoster [1974] found that unfavorable feedback did not. The common point in these

studies is that the budget was again accepted as a _fait accompli_ by the subjects. But in this experiment, almost all of the significant polarizations possibly represented compliance and possibly were not internalized by the subjects. If this is applied to natural settings, the goal (budget) established by a group may not be cognitively accepted by individuals. Rather, the budget may be only an artifice of the group. Research is suggested on effects of feedback based on non-internalized budgets and how such effects differ from those already found by previous investigations. Additionally, work could be conducted on the effects of attitude and behavior by the tacit acceptance of non-internalized goals for purposes of interpersonal processes.

LIMITATIONS

The primary limitation of this study is that of surrogation manifested at three levels. First, the surrogation of the laboratory for a natural setting is generally a necessary trade-off to control independent variables [Kaplan, 1964]. The laboratory exists for the purpose of the research study. Actors in such a setting are there to participate in the study. Hence, their motivation has a different basis than in a normally incurred part of their lives-- not necessarily lessened or heightened, but different. In this manner, the situation becomes artificial, sacrificing "realism" for preciseness [Runkel and McGrath, 1972]. The laboratory setting was most appropriate for this research for, as Kerlinger [1973] notes, the laboratory experiment has as one of its purposes

the testing of predictions derived from theory. As indicated, all of the predictions of Chapter III were derived from the theories and the model built in Chapter II. The second surrogation problem is a product of the first-- the abstraction from reality by the use of a scenario. Because of the nature of the subjects and the laboratory setting, such a device was necessary. The subjects did not belong to an organization and lacked the common background assumed in the experiment. The final surrogation problem was the use of students as subjects. This has been treated in Chapter III and will not be discussed here.

A second limitation is that this study does not address all types of expenditures but is constrained to only discretionary costs. For the reasons noted in Chapter I, GP is not likely to manifest itself in non-discretionary areas thereby reasonably justifying this exclusion from the study.

A third limitation is that the resultant budget is one that will form, in part, the organizational goals in a real-world setting. These goals, in turn, will form the standards that the budgetary participants will have to "live with" for the budgeted period. To test effects in this type of environment calls for a longitudinal study. In this experiment, subjects were finished with the budget once the experiment ended. The effects of goal formulation caused by subsequent feedback and evaluation cannot be determined from this work.

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APPENDIX A

SCENARIO

Walton Electric Corporation is one of the giant United States corporations that manufactures and sells electric and electronic products. Sales in 1979 were in excess of $2 billion and profits after taxes were over $150 million. The operating activities of the corporation are divided into four groups, each headed by a group vice-president. These groups are: the Electrical Generating and Transmission Group; the Home Appliance Group; the Military and Space Group; and the Electronics Group. Each of these groups is comprised of a number of relatively independent divisions, each headed by a divisional manager. The group is the basic operating unit of the corporation. The divisional manager is responsible for earning an adequate profit on his division. There are twenty-five divisions in the corporation.

The Electronics Group develops, designs, manufactures and markets a full range of electronic products for the consumer market. These range from small, inexpensive record players to exotic electronic equipment. The Electronics Group, like all groups, operates somewhat autonomously, having discretion over amounts budgeted for research and development (R&D), manufacturing and marketing. Because of the necessity of long lead times, the manufacturing budget has already been set leaving only the R&D and marketing budgets to be determined.

The development of the budget within the Electronics Group is as follows. Proposals for projects, including estimated costs and risks associated with eventual results of the projects, are submitted to James King, vice-president of the Electronics Group. King turns over the proposals to a young and dynamic group of employees to help him determine the R&D and marketing budgets and wants them to reach a "consensus" decision which he will review. King, a very successful executive, demands clear thinking and solid reasoning behind any recommendations made to him, and he makes final decisions regarding the allocation of the budget.

You are a new researcher / advertising person who has been with Walton about two years. As such, your duties have brought you in contact with some of the exciting things the firm is in the process of creating. Your associates are congenial, and your relations with superiors have gone well during your tenure at Walton. Because of your superior progress, King has appointed you, as one of a group of three, to recommend the total amount of the R&D and marketing budgets for the next few years. Your task here will be to develop the recommended budget for R&D and marketing from the list of projects which

follows. Read over the projects and determine the amount you
think should be spent for R&D and marketing for each area.
Any funds allocated to R&D will cause a reduction in the adver-
tising budget, and vice-versa. Afterward, you will meet as a
member of a group of three people to make a "consensus" decision
for a final recommendation to James King. A short debriefing
will follow the group meeting. Use all of your knowledge and
intuition to aid you in your decision. An organization chart
is attached to help explain the structure of Walton Electric.
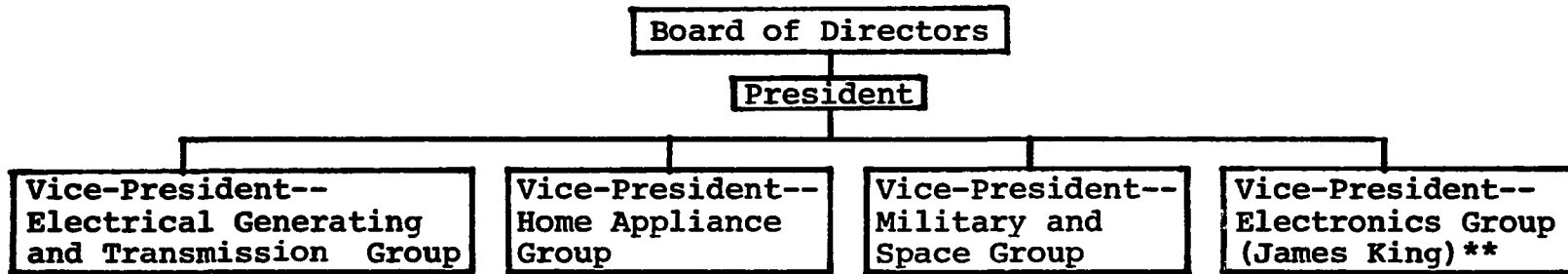
Projects

1. A new area in the home entertainment industry is the use of
digital playback equipment for records and tapes. Market analysts
see an almost total conversion from present analog to digital
equipment within the next decades. This change will signifi-
cantly increase the fidelity of new commercially available
encoded records and tapes. Because of the high level of
technology involved, initial projects will be rather expensive
and appeal primarily to the audiophile market. Because of
previous R&D work already completed by the Military and Space
Group (available to you free of cost), digital technology at
Walton is in place, but much R&D needs to be done to adapt
space technology to the consumer market. From the marketing
point of view, a large campaign will be needed to educate the
public regarding digital advantages and to overcome skepticism
about an entirely new product. R&D and marketing risks are
seen as substantial. Estimates of R&D expenditures in this area
range from $500,000 to $2,000,000. Estimates of marketing
expenditures in this area range from $400,000 to $2,100,000.

2. Despite the coming of digital playback equipment, existing
lines are still considered quite viable and product development
is seen to be needed for the next several years. The use of new
types of transistors, continued circuitry miniaturization and
increased use of cosmetic devices such as LEDs are viewed by
market analysts as desirous. R&D risks are seen as minimal,
whereas marketing risks would be about medium. Estimates of
R&D expenditures in this area range from $300,000 to $1,200,000.
Estimates of marketing expenditures in this area range from
$400,000 to $1,300,000.

3. A burgeoning area is that of consumer electronic products.
Such diverse items as home security systems, improved telephone
answering systems, electronic air filtration systems, etc., are
foreseen as an important growth area by market analysts. Due
to the diversity of products, R&D risks would be medium whereas
the marketing group envisions rather an easy task in promotion
and distribution through established channels. Estimates of
R&D expenditures in this area range from $600,000 to $1,900,000.
Estimates of marketing expenditures in this area range from
$500,000 to $2,000,000.

4.   A final project currently under consideration is increased development of the personal computer market. Although competition already exists in the area, growth is considered virtually unlimited as manufacturing costs are reduced through technological development. Additionally, the marketing group predicts that Walton's existing mini-computers could be greatly expanded in the market if a significant sales effort is made on a test basis. Competitors' efforts in marketing have been rather modest to date, and real breakthroughs are seen with a comprehensive promotional campaign. Because of recent development in the work done by the Military and Space Group (again, available to you at no cost), R&D risks are minimal. Marketing risks are also seen as minor. Estimates of R&D expenditures in this area range from $90,000 to $180,000. Estimates of marketing expenditures in this area range from $40,000 to $130,000.
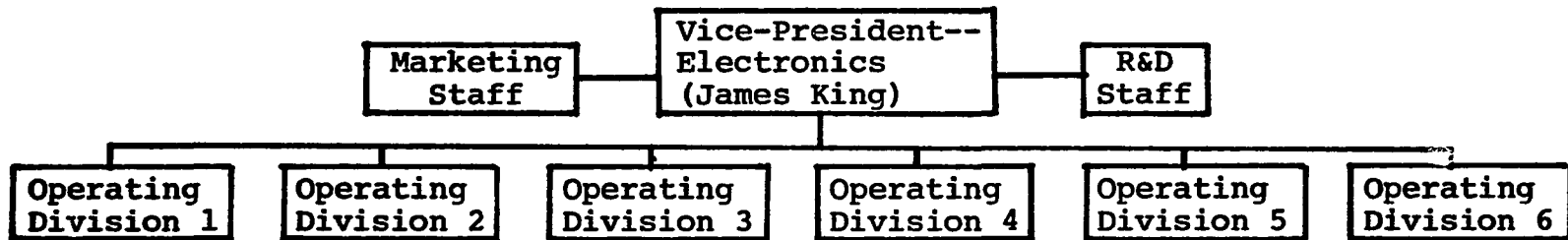
WALTON ELECTRIC CORPORATION

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│ Vice-President--   │ │ Vice-President-- │ │ Vice-President-- │ │ Vice-President--   │
│ Electrical Generating │ │ Home Appliance   │ │ Military and   │ │ Electronics Group   │
│ and Transmission Group│ │ Group   │ │ Space Group   │ │ (James King)**   │
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                        **Detail of
                      Electronics Group

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│ Marketing   │ │ Vice-President--   │ │ R&D   │
│ Staff   │ │ Electronics   │ │ Staff   │
│   │ │ (James King)   │ │   │
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APPENDIX B


ADDITIONAL INFORMATION


Due to information supplied by a friend of yours in administration, you are aware of certain facts that are unknown to the other members of your group. You may share your knowledge with them during the group discussion if you wish.

1. Last year, Walton Electric was cited by nationally recognized R&D and marketing professional societies for outstanding accomplishments in these respective fields.

2. During the past five years, approved R&D and marketing budget figures for the Electronics Group are as follows:

|      | R&D         | Marketing   |
|------|-------------|-------------|
| 1979 | $3,050,000  | $2,500,000  |
| 1978 | 2,750,000   | 2,300,000   |
| 1977 | 2,450,000   | 2,150,000   |
| 1976 | 2,080,000   | 1,935,000   |
| 1975 | 1,770,000   | 1,750,000   |

## VITA

Frank Peter Daroca, Jr. was born in New Orleans, Louisiana on January 7, 1942. After local parochial elementary and secondary schools, he attended Louisiana State University (New Orleans campus) where he received a Bachelor of Science degree in 1964 majoring in accounting. After two years in public accounting, he worked in private industry, primarily in oil and gas. In 1974 he received a Master of Science with a major in accounting from the same institution. While pursuing the Ph.D., he was a teaching assistant at the University of Illinois at Urbana-Champaign and an assistant professor of accounting at Illinois State University in Normal.

He is a Certified Public Accountant in Illinois and Louisiana and a member of the American Institute of Certified Public Accountants and the American Accounting Association. Honors include membership in Beta Alpha Psi, Beta Gamma Sigma and Phi Kappa Phi. He received a dissertation award from Coopers & Lybrand. Currently, he is an assistant professor of accounting in the School of Accounting, University of Southern California.

Previous research includes a master's thesis, "Future-Services Costing: A Methodology for Evaluation of Unrecovered Oil and Gas Reserves for Financial Statement Presentation."