

THE IMPACT OF ORGANIZATIONAL
REWARD AND MEASUREMENT SYSTEMS
ON COALITION FORMATION
IN THE BUYING CENTER

by

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(ABSTRACT)

The effects of different types of reward systems on perceived conflict and coalition formation among those involved in organizational buying decisions are investigated. The buying decision process is examined as group behavior, and the group or buying center is used as the unit of analysis.

An experimental design is utilized to test a number of hypotheses concerning the impacts of cooperative, competitive, and independent reward systems on the level of perceived conflict and the extent of coalition formation within the buying center. Groups consisting of representatives from a number of different departments within a hypothetical organization are asked to make a series of vendor choice decisions while being evaluated in terms of one of these three reward systems.

The findings suggest that perceived conflict increases as one moves from a cooperative to an independent, and then to a competitive,

reward system. Coalitions appear most frequently under an independent reward system, less frequently under a competitive reward system, and infrequently under a cooperative reward system. Implications are drawn both for buying and selling organizations.

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Chapter 1

INTRODUCTION

Much of the research emanating from the marketing discipline has a managerial orientation. The needs of a specific client group, the practicing marketing manager, tend to receive priority among researchers. As a result, theoretical developments often lag empirical findings. Theory is, however, a very practical concern, as it enables the explanation, understanding, and prediction of real-world phenomena. Theory and practice go hand in hand. Unfortunately, this is not always the case in marketing, especially in the areas of industrial marketing and organizational buying behavior. This study endeavors to examine a topic of concern heretofore largely untouched by investigators, coalition formation within the buying group. It does so within the context of a developing theoretical framework which might be termed the inducements/contributions paradigm. Any number of practicing managers could benefit from an improved understanding of behavioral dynamics involved in purchasing processes. Examples include top managers attempting to ensure overall company objectives are being carried out, functional area managers designing reward and measurement systems, and marketing managers concerned with the design of the marketing mix. The primary intent of this study is to provide all students of buying behavior in organizations with a better understanding of the central role played by coalitions among those involved in buying, and to demonstrate

that behavioral strategies are ultimately motivated by one's quest for rewards.

1.1 STATEMENT OF RESEARCH PROBLEM

Organizational buying is a dynamic process involving a number of different actors influenced by both purchasing task-related and non-task related variables. As a process, purchase decisions evolve through a series of stages including problem awareness, information search, alternative evaluation, product and vendor selection, determination of order routine, and post-purchase review. Although many routine decisions are made autonomously, purchasing is more typically a group process. A fundamental tool developed to aid in conceptualizing this process is the "buying center," defined as "all those individuals and groups who participate in the purchasing decision-making process, who share some common goals and the risks arising from the decisions" (Webster and Wind, 1972). The buying center is pictured as a hypothetical composite of five roles: buyer, user, influencer, decider, and gatekeeper. As a group process, the purchasing manager might, for example, be the buyer, but the actual decision may be made by someone in production, quality control, or top management. The importance of these roles and the identity of the people filling them can change over the stages of the decision process, as well as over different purchase decisions.

One implication of the buying center perspective is that purchase decisions not only involve negotiations between buyer and seller, but also within the buying organization. A buying center

may generate considerable conflict over a given vendor or product selection. One means of explaining this conflict is in terms of organizational reward and measurement systems (Wind, 1971; Anderson, 1981). To the extent that the departments represented in the buying center pursue conflicting objectives, and incorporate these objectives into rewards offered to their members, conflict is likely in organizational buying. Where engineers have a role in purchase decisions, they may be reacting to a reward system that emphasizes technical specifications and exact tolerances, while purchasing personnel may be rewarded for cost savings.

The organizational process being described involves a collection of individuals, each of whom represents some group, faction or department. As a result, each of these individuals is a member of two groups--his/her department or functional area, and the buying center. The buying center may also control certain rewards which the individual values, and so it may also exert some influence on his/her behavior. Buying centers tend to be small, informal, temporary groups, however, especially when compared to the permanency of the various functional groups in the organization.

As a group phenomenon within an organizational context, buying center behavior is ultimately work behavior. Individuals in the buying center are pursuing their self-interests within the parameters of the organizational control system. While organizations have numerous mechanisms to influence and control individual action, the formal reward and measurement system is of principle concern

to the employee (Kerr, 1975). When individuals "enter" the buying center, they bring to it the values and objectives incorporated into the rewards and measures applied to them. The resultant phenomenon is an ad hoc, heterogeneous group characterized by conflict, where the group task requires inputs from a number of functional areas in the firm. That is, the various actors are task-interdependent. Given this, the ability of any one actor to obtain rewards is contingent on the actions of others.

The individual, in pursuing self-interest, may be confronted by a mixed-motive bargaining situation. There is an incentive to compete, due to the conflicting needs and objectives of the various functional areas. There is also an incentive to cooperate due to the task- and reward-interdependencies. In addition, members of the buying center do not usually have equal resource-power positions, and purchase decisions are rarely hierarchically imposed by top management. However, these role players must somehow reach a consensus within this complex scenario. One rational strategy might be the formation of coalitions between and among departments within the buying center. A coalition could enable its members to enhance their power and influence in purchase decisions, and may be an effective means of conflict resolution.

The purpose of this dissertation is to investigate coalition formation as a group process within the buying center. Activity within the buying center will be looked upon as small group behavior. The dissertation utilizes an experimental design to focus on the

ways in which different types of reward structures offered by various functional areas in the firm affect their members' likelihood to form coalitions with representatives of other functional areas. More specifically, this research examines the impact of reward systems emphasizing competition versus cooperation on the extent of perceived conflict and the frequency and composition of coalitions in the buying center. It investigates the hypotheses that coalitions are unlikely under reward systems encouraging extensive cooperation or extensive competition, while they are likely under reward systems containing a mixture of both cooperative and competitive incentives.

The following section presents a brief overview of research concerning the roles played by rewards and coalitions in group decision-making and discusses the group nature of organizational purchasing decisions. It is argued that an integration of research on rewards, groups, and coalitions will provide considerable insight into the nature of organizational buying behavior.

1.2 RESEARCH FOUNDATION

Organizations differentiate themselves structurally into functional sub-divisions to achieve an economy and efficiency of operations in coping with changing environmental demands (Lawrence and Lorsch, 1967). These functional areas are expected to develop an expertise in fulfilling some specific need of the organization, such as engineering design, quality control, sales, production, accounting, and financial analysis. They develop departmental or functional area objectives in line with the organizational need

or mission they are charged with fulfilling. They develop reward systems which are designed to ensure that departmental objectives are met, and measurement systems to aid in monitoring and evaluating individual efforts. Moreover, departments develop specific norms, mores, and role expectations for their members, and a socialization process takes place over time (Mortimer and Lorence, 1979). Senior management, of course, must ensure that departmental objectives and activities are instrumental to the accomplishment of overall organizational objectives through its coordination function.

There are a number of organizational activities, however, in which successful achievement hinges on an integration of these functional areas. Purchasing processes represent an example, in that the organization relies upon inputs from any number of departments to accomplish overall purchasing needs and objectives. The joint-decision nature of these processes is well-established in the literature, as in the buying center construct which was designed to represent them. What is not established is any body of research findings to explain the behavioral dynamics within the buying center.

The activities within the buying center represent group processes resulting in group decision-making. Interfunctional involvement in the buying center implies multiple motives, varied interests, and possibly conflicting objectives among participants. The recognition of this fact has led to the development of general descriptive models of organizational buying behavior (i.e., Webster and Wind, 1972; Sheth, 1973). Such models identify many of the variables

impacting on purchase decision-making, but are vague concerning the ways in which these variables interact. While the models have not been validated, they have provided the predominant frameworks within which much of the ensuing work has been carried on. The body of research which has evolved concentrates largely on establishing the relationships between and among specific variables deemed integral to the purchasing process in a firm, and many of these variables are drawn from the general models. The result is a disjointed set of findings which have not been integrated into a coherent research program (Anderson, 1981).

The fundamental importance of the departmental reward and measurement systems represents the basis for a possible unifying framework for this research. Ultimately, organizational behavior is a composite of individual and group actions. One approach to explaining the motivation underlying individual behavior is expectancy theory (Vroom, 1964). Here, the effort an individual exerts toward some task is a function of his/her perception of the probability that successful performance will follow the effort, his/her belief that successful performance will be instrumental in achieving certain desired outcomes or avoiding undesired outcomes, and the strength of attraction those outcomes hold for the individual. The managerial implications are that superiors must ensure that they are offering the employee the proper bundle of reward outcomes, and that the employee is perceptually aware of the links or paths from effort to performance and from performance to the reward outcomes (House

and Mitchell, 1974). If the measurement system is such that these linkages are not apparent, then the organization may be encouraging dysfunctional behavior (Kerr, 1975).

The importance a member of the buying center places on certain specific product or vendor evaluative criteria and the actual evaluative process utilized should reflect the criteria around which the individual's reward and measurement system is built. This assumes, of course, that people view organizational membership as a means to fulfilling personal needs and objectives, and that individual behavior within an organizational context is strongly influenced by the manner in which people are rewarded and measured (Anderson, 1981). While the likelihood of conflict in any joint purchase decision process has been emphasized (Sheth, 1973) and the findings of organizational behavioralists on interdepartmental conflict support this likelihood (Walton, Dutton, and Cafferty, 1969), few inferences have been drawn from the fact that competing reward and measurement systems underlie this conflict.

There is a developing body of research on the influence of rewards on groups. Much of this builds on the work of Deutsch (1949) and Miller and Hamblin (1963) concerning the impacts on group productivity of a reward system encouraging cooperation versus one encouraging competition. An example of a purely cooperative system would involve giving equal rewards to every member of a group based on the group's level of performance, and so each member's actions lead to rewards for themselves as well as others. A purely competitive

reward system might involve giving the entire reward to the group member with the best performance. An independent system would reward a given group member in accordance with his/her productivity regardless of how others perform. It appears that task-interdependence within a group is a major intervening variable between rewards and performance. In task-interdependent situations, cooperative reward structures tend to generate greater productivity than competitive structures. Where a mixture of cooperative and competitive elements is found, the competitive component has the dominant impact on individual behavior (Rosenbaum, 1980). There is also evidence that the way in which a group responds to a reward system is affected by the presence of an interdependent coacting group, and is an incentive for a mixed cooperative-competitive orientation (Okun and DiVesta, 1975). One implication from this research program is that different types of reward scenarios result in the development of specific behavioral strategies by individuals in groups, especially when they are mutually dependent on others in the group for task accomplishment. Moreover, collective action is irrational from the individual's standpoint in the absence of specific incentives encouraging a group orientation by that individual. Individuals view the group as a means to fulfilling their own self-interest, and cooperate with other group members if rewarded for doing so. Even when individual rewards encourage cooperation, however, the group members may perceive only a weak correlation between his/her rewards and the overall group product.

Within the context of the buying center, representatives are responding to the separate reward systems of their functional departments. These systems may effectively engender a cooperative or competitive orientation on the part of each individual. The question becomes which behavioral strategies departmental representatives will pursue in response to these reward systems. In a sense, the members of the buying center are pursuing individual interests which may conflict in a setting in which 1) there is a lack of any formal structure, 2) resource-power positions of the actors are unequal, 3) there are interdependencies among the roles, 4) group interaction is temporary or relatively short-lived, and 5) the group is relatively small. Research in the area of intergroup conflict suggests the existence of extreme loyalty to the primary group when interacting with competing groups, even when it is recognized that compromise would result in a better solution to the task at hand (Blake and Mouton, 1961). Sherif (1966) has done extensive work demonstrating the effectiveness of a superordinate reward in such situations. In the absence of a superordinate reward in the buying center setting described above, conflicting individual reward systems may encourage the formation of coalitions.

A coalition is a cooperative strategy between certain group members aimed at enhancing their competitive position vis-a-vis other group members. Research on coalitions has traditionally concentrated on the important role played by differential resource-power positions as an incentive for their formation (e.g., Caplow,

1956). More recently, however, a good deal of support has been generated for the idea that rewards or payoffs are a more important determinant, and perhaps the most important (Komorita and Tumonis, 1980; Miller, 1980; Kravitz, 1981). From an expectancy theory perspective, individuals form coalitions as a function of the payoffs or rewards available, and the instrumentality of the coalition for obtaining the reward outcome. Coalition formation in the buying center may generate any number of potential payoffs, but should ultimately enhance the ability of the individual to do well vis-a-vis the reward and measurement system in his/her department or functional area. Further, people select coalition partners as a function of attitudinal agreement with them regarding issues vital to the task at hand (Lawler and Youngs, 1975). These attitudes should be reflective of the departmental objectives incorporated into the rewards and measurements facing each coalitional partner.

For any one department to optimally fulfill all its needs and objectives in a given purchase, other departments are likely to sub-optimize. Similarly, the maximum levels of rewards available to any one member of the buying center may be affected by the rewards achieved by other members. As a result, a relationship may exist between the rewards received by one person and the behavior of another. The critical factor in explaining how much buying center members pursue only their own interest, adopt a cooperative attitude toward some while competing with others (coalesce), or attempt to cooperate with all others in the buying center is the design of

the organizational reward system. That is, it is a function of where the reward system lies along a continuum from purely cooperative to purely competitive.

To draw a hypothetical example, the assumptions can be made that a purchasing department representative is measured and rewarded on cost savings to the firm, a production representative on timely productive output, and an engineer on the quality of product performance. Obviously, optimal quality, optimum speed or timeliness in delivery, and minimum cost objectives conflict. If these three representatives are in the buying center, an organizational emphasis on cooperation versus competition is going to say something about which objective is stressed in the actual purchase decision. If management has opted, either intentionally or unintentionally, to design a reward system stressing win-lose competition between departments, the result may be a very political purchasing environment characterized by cut-throat tactics and deadlocks in decision-making. Alternatively, if management is rewarding cooperation among the collective interests in the buying center, the result may be an environment characterized by a willingness to compromise in developing creative solutions to the organization's purchasing needs. Another possibility might be that management has created a reward system emphasizing mixed motives. An example might involve a situation where departmental representatives are rewarded for their individual contributions, but are interdependent with other departments for accomplishments of the task. In this case, a competitive

orientation towards other departments and their vendor or product preferences increases the size of the potential reward to a given departmental representative, but also increases the potential risk. The risk is enhanced because of the limited likelihood that any one department can accomplish the organizational buying task alone. Another important consideration here is the relative resource/power positions of the buying center members. Under such circumstances, coalescing with some members so as to enhance one's overall competitive position would seem to be a rational strategy. The decision to form coalitions should reflect the trade-offs between rewards sacrificed and risk reduction.

The fundamental implication of this discussion is that the rewards and measures of functional areas in the organization underlie behavioral dynamics in the buying center, and especially coalescing behavior. When interdepartmental relationships in buying decisions are conceptualized as a group process, as in the buying center, it becomes important to investigate the effects of group rewards. Walton, Dutton and Fitch (1966) have examined rivalry and collaboration among departments in a firm and found interdepartmental relationships to be quite similar to interpersonal relations among individuals. Thus, coalitions among departments in the buying center should be analogous to coalitions among individuals in a group context.

The literature on organizational buying behavior is largely devoid of any research findings on coalitions (Corey, 1978; Bonoma

and Zaltman, 1978; Bagozzi, 1978; Anderson, 1981), while the impact of rewards on buyer behavior has not received much more attention (Wind, 1971; Webster and Wind, 1972; Anderson, 1981). Some of the more recent research has emphasized a social psychological approach, based largely around the role of communication channels in the buying center (Spekman, 1978a, b; Bagozzi, 1978; Bonoma and Zaltman, 1978; Bonoma and Johnston, 1978; Krapfel, 1978; Johnston and Bonoma, 1979; Johnston and Bonoma, 1981; Bonoma, 1982). Even here, however, there are implications which can be drawn for coalition behavior. For example, the presence and use of two-way channels of communication between group members, especially when it is personal or face-to-face, enhances the likelihood of coalition formation (Francis, 1970; Lawler, 1975; Pool, 1976). Correspondingly, the absence of communication links lessens the likelihood of coalitions and appears to favor those in the strongest resource/power position.

1.3 RESEARCH JUSTIFICATION

While endeavoring in the preceding section to outline a theoretical and empirical foundation for research relating the formation of coalitions in the buying center to reward structures encouraging competition and/or cooperation, it is also necessary to justify the importance of such research. Toward this end, the relative scarcity of industrial marketing and organizational buyer behavior research is emphasized below, and problems in current efforts to conceptualize, measure and apply theories regarding organizational buying phenomena are summarized. The fundamental value of a social

psychological perspective and the need to integrate related research are emphasized. This dissertation represents an attempt to incorporate such a social psychological approach, and to address many of the measurement shortcomings of current and past research in the area. In doing so, hopefully a contribution is made toward understanding the crucial roles played by rewards and coalitions in organizational buying activities from both a research and a managerial perspective.

Although industrial markets account for far more of the expenditures in the economy than consumer markets, and purchases account for over 50 per cent of the sales of the average industrial firm, the bulk of marketing theory and research is oriented toward issues in consumer marketing. This has led some to observe that "the industrial sector has long been regarded as the stepchild of marketing in terms of research devoted to its problems" (Lillien, Silk, Chofray, and Rao, 1976, p. 16).

This lack of emphasis may be due to the misperception that consumer and industrial marketing are sufficiently similar as to not warrant separate treatments. Although they overlap and can mutually benefit from one another, these two fields have significant differences with important implications for both the theorist and the practitioner. The industrial market involves professional sellers selling to professional buyers, in an oligopolistic setting, often for large dollar amounts and/or large physical quantities. Ability to meet technical specifications and to provide service receive

much more emphasis than expensive promotional campaigns. Distribution channels tend to be shorter than in consumer markets, and are often direct. Demand is subject to a multiplier effect, in that it is derived from ultimate consumer demand. Bidding is a common practice, and discount structures are an important price feature. The primary bases for segmentation are geographic and usage. More important than all of these distinguishing features between the two markets, however, is the nature of their respective buying processes.

Industrial purchases commonly involve joint decision-making among a number of actors in an organizational context. As such, these decisions represent work behavior, and the individuals participating in them are subsequently evaluated and rewarded according to certain criteria. These purchase decisions are often made over an extended period of time, and the individuals or departments involved may vary over the decision-making process. Researchers have identified roles in this process, but the identity of the role players in a given organization is difficult to predict. The buying center was developed as a means to conceptualize the process in terms of these roles. As a conceptual framework, it is the central focus of this study.

The buying center construct has been emphasized as the major subject for future research efforts in industrial buying (Bonoma and Zaltman, 1978; Wind, 1978). The importance of additional research on this construct is due to a fairly limited understanding

of its nature and functioning, especially from a behavioral perspective. Moreover, it is a concept which is relevant in a wide range of industrial buying contexts. As such, it would be a mistake to classify the buying center as a largely pedagogical tool with limited relevancy for all but a handful of purchase decisions.

While there are many routine or repetitive purchase decisions made autonomously within the purchasing department, the buying center does not come into play only where large dollar amounts are being expended on capital equipment. However, it is estimated that even the typical small business currently spends over \$150,000 on industrial purchases for their manufacturing process (Bonoma and Johnston, 1978), and it does not seem likely that decisions regarding such expenditures are made autonomously by a single department. Examples of purchases in which a number of departments may be involved include heavy equipment, portable or light factory equipment and machinery, machine tools, fabricated component parts, raw materials, and processed materials. For products in these categories, decisions often require inputs from, among others, departments that set technical specifications, evaluate quality, use the product, deal with customers and their needs, financially account for purchases, and evaluate legal aspects of a given purchase. Even where a vendor or product has been selected, and ongoing decisions involve little more than re-ordering by the purchasing department, rapid changes in the economic environment, in technology, in competition, in regulation, and in customer needs suggest that additional departments may get

involved over time (Hutt and Speh, 1981).

While it is recognized that buying centers are social psychological phenomena, the implications of this are not well understood. Bonoma and Zaltman (1978, p. 11-12) summarize that "In short, we do not know at this time how buying centers are composed, who tends to participate in them, or how decisions are made by the participating individuals." Perhaps the most fundamental reason that research efforts are floundering concerns the failure by the relevant scientific community to develop or reach any consensus regarding a unifying, coherent paradigm. Kuhn (1962, p. 43) has indicated that "close historical investigation of a given specialty at a given time discloses a set of recurrent and quasi-standard illustrations of various theories in their conceptual, observational and instrumental applications. These are the community's paradigms, revealed in its textbooks, lectures, and laboratory exercises." Lakatos (1974) explains that such paradigms or research programs are judged according to their ability to identify and cope with novel phenomena and to suggest a path or course for future research activities. A paradigm includes the philosophical methodology and the accepted conceptual building blocks used to formulate theory (Laudan, 1977). In the industrial marketing arena, there does not appear to be any consensus regarding the accepted paradigm within which scientific progress can take place. There is, correspondingly, no general agreement regarding the important research problems, research priorities, or future research directions (e.g., Wind, 1978; Wind and Thomas,

1980).

A number of researchers are involved in the development of a dyadic exchange paradigm, which is an especially useful means of conceptualizing buyer-seller interaction, and which can also be used to examine social exchange within an organization (Bonoma, Bagozzi, and Zaltman, 1978; Bonoma and Johnston, 1978; Wilson, 1978). Another alternative, recently proposed by Anderson (1981), is that theories, models, and hypotheses be developed around the assumption that work activities are motivated by the quest for intrinsic and extrinsic rewards, and thus that work-related buying and selling behavior can be explained in terms of the rewards available and punishments avoidable by maintaining membership in the work organization. Membership is maintained through satisfactory performance on some measurement system. Such an inducements-contributions perspective builds on the classical work of Barnard (1938) as well as that of the expectancy theorists (e.g., Vroom, 1964; Galbraith and Cummings, 1967; Porter and Lawler, 1968; Graen, 1969; Mitchell and Biglan, 1971).

Many of the subjects currently receiving attention in the industrial buyer behavior literature can be explained in terms of rewards. Examples include risk-taking, attribute importance, innovativeness, bargaining behavior, product evaluation processes used by individuals both before and after a purchasing decision, and power relationships in the buying center. This dissertation endeavors to demonstrate how one such phenomenon, coalition behavior in the buying center,

can be explained through the system of rewards and measurements found in an organization.

While little progress has been made toward the development of a reward paradigm within industrial marketing, Anderson (1981) has attempted to develop a model of organizational buying behavior based entirely on the reward system. To the extent that this dissertation finds that individual strategies used in decision-making are significantly affected by the reward systems facing buying groups, it will provide further basis for the development of such a paradigm.

The emphasis on coalitions in this research is due to the potentially vital role they may play in the organizational buying, and to the fact that coalitions have been largely ignored in the empirical research to date. The importance of coalition formation in buying centers has been stressed by a number of authors, and the likelihood of this behavioral strategy in a wide range of buying decisions has been suggested (Corey, 1978; Bagozzi, 1978). Bonoma and Zaltman (1978, p. 12) go so far as to suggest that coalitions are responsible for most of the decisions in the buying center. This dissertation is an attempt to determine whether or not there exists a causal relationship between the reward system faced by individuals and the likelihood that they will coalesce.

It is important, in achieving an understanding of the behavioral dimension of industrial buying, to systematically integrate the extensive literature in the fields of social psychology and organizational behavior. While such a task is quite imposing, it would

appear to be a prerequisite for the further development of the discipline. This dissertation attempts to make a contribution in a few select areas, including group behavior, groups and rewards, intra- and inter-group conflict, groups and coalitions, and rewards in coalitions.

Another reason for the relative paucity of research in the industrial sphere is the existence of significant measurement problems some of which are addressed in this dissertation. Group decision-making implies a need for group research. This is quite time-consuming in an organizational setting, for one must first identify the relevant people and then survey, experiment with, or observe them. The dynamic nature of buying group membership and behavior makes this especially challenging. Studies at the group level often lack the proper representation of individuals, as well as the interdependencies among them. Subsequently, most studies use the individual as the unit of analysis, which is inappropriate if buying is truly a group phenomena. As a generality, the extant research appears biased in the direction of the purchasing department's perspective. There is a strong reliance on purchasing agents as subjects, often identified through professional affiliations.

The research designs are rarely longitudinal, and thus ignore the temporal dimension of the buying process. The cross-sectional nature of many studies makes it difficult to identify causal relationships between variables. Further, given that entry into organizations is often difficult, and that people at work have little time

to spare, many of the research efforts suffer from sample size limitations. Additionally, differences among organizations within an industry, and between industries, raise problems for generalizing the results of any empirical study.

To address some of these methodological problems, this dissertation provides a research design in which the group is the unit of analysis, sample size limitations are overcome, the purchasing department bias is eliminated, and causal inferences can be made between independent and dependent variables. An experimental design is used with student subjects. This allows for larger samples, where the units are groups. It also provides the necessary control over the variables of interest. Purchasing problem scenarios are developed with a realistic level of rigor and complexity given the knowledge and experience of the subjects. Competitive, cooperative, and independent reward systems are implemented in a controlled setting, and perceived conflict and coalitions are measured at the group level. Additional contributions are made in terms of a methodology for measuring each of these dependent variables.

Finally, there are a number of potential implications of this research which have managerial significance. From a marketing perspective, it has been proposed that the buying center consists of a number of roles, and the common interpretation is that various individuals fill these roles (Webster and Wind, 1972; Wind, 1978; Bonoma, 1982). That is, certain people can be identified as deciders, but they are viewed individually. However, it may be that coalitions

of influencers form, or that through coalition formation, some users or influencers become deciders. Perhaps the combined informational inputs of the parties to a coalition may make it the gatekeeper, where each member of the coalition could not separately be construed as such. Salespeople in general have an especially difficult time identifying the principle sources of influence or the decision-maker, if one exists. Those designing marketing strategy may find it more profitable to target their efforts to the mutual or compromised interests of coalitions between departments, as opposed to individual departmental interests. Where reward systems result in conflict and coalition formation, salespeople may find themselves in a much more political environment. This, in turn, may effect the types of product and vendor attributes which are emphasized, as well as the sources and amount of information sought concerning a purchase decision. Moreover, if coalitions are being encouraged, the length of the buying process may be affected, as well as the tendency to engage in source loyalty, both matters of concern to the marketer.

The results of this research may also be of interest to managers of the buying organization. They may find it worthwhile to examine the degree to which organizational reward and measurement systems are encouraging cooperation or competition, and the resultant impact on the quality of purchase decision-making. An over-emphasis on competition may result in goal-suboptimization in purchase decision-making. As a result, the firm may be spending too much on purchases relative to the benefits received. The presence of dominant

coalitions may make it more difficult to seek out new and better vendors or novel product alternatives unless significant problems occur with existing sources. In addition, a coalitional perspective may point to the need to examine purchase decisions within the context of the ongoing purchasing needs of the firm. The payoff to any coalition or member of a coalition may include influence on future decisions (Gamson, 1961). Thus, the behavior of an individual may be reflective of a more long-term strategy than is typically allowed for in research on buying behavior or in sales strategies.

1.4 RESEARCH OBJECTIVES

In summary, this research has been undertaken in order to:

- A. Integrate relevant research from the fields of social psychology, organizational behavior, political science, and economics concerning groups, rewards, conflict, and coalitions into research on organizational buying behavior;
- B. Develop a conceptual model relating different types of organizational reward structures (cooperative, competitive, and independent) to perceived conflict and coalition formation in the buying center; and, generate specific testable hypotheses concerning the nature of the relationships between these rewards as independent variables and both conflict and coalition formation as separate dependent variables;
- C. Design and conduct a laboratory experiment which allows rewards to vary and coalitions to form in buying centers

constructed with the use of student samples. This experiment will allow for analyses of both the amount of coalition formation and the composition of specific coalitions as subjects representing different departments in an organization attempt to make buying decisions; an important aspect of this design is that it will utilize the group, rather than the individual, as the unit of analysis;

- D. Present empirical evidence of any contributions a reward perspective has for explaining behavioral dynamics in the buying center, and draw implications for marketing management.

Chapter 2

REVIEW OF THE LITERATURE

To provide a more complete picture of the theoretical foundation and relative contributions of this dissertation, three general bodies of research are addressed in this chapter. First of all, given that the buying center is the subject of this research, and that it represents a group process, the literature on group behavior as it is influenced by reward structures is summarized. Second, the extensive literature on coalition formation as a group dynamic is surveyed, and relevant findings on rewards as a causal influence are highlighted. Third, the group nature of organizational buying is discussed, and the role of rewards as a motivational influence and as a source of conflict within the buying center is expounded upon. Following this, an attempt is made to integrate the literatures on groups, rewards, coalitions and conflict within the context of organizational purchasing activities. In doing so, the scant treatment given to rewards and coalitions in theoretical and empirical research on industrial buyer behavior is reviewed. Finally, a conceptual model and hypotheses are presented based on this literature.

2.1 GROUP BEHAVIOR AND REWARD SYSTEMS

Cartwright (1951) defines group dynamics as the set of forces which are operating in a given group. He explains (1951, p. 382) that "the investigation of group dynamics, then, consists of a study of these forces: what gives rise to them, what conditions modify

them, what consequences they have, etc." One determinant of these dynamics is the externally imposed system of rewards and punishments, which is the focus here. Research of this sort is grounded primarily in the area of social psychology, as well as organizational behavior, economics, and political science. While psychology deals with the individual, sociology is concerned with social units. This research will look at the effect of an organization variable (the formal reward and measurement system) on the individual, and the collective functioning of a small group (the instigation and resolution of conflict in the buying center). A group can be defined (Shaw, 1976, p. 11) as "two or more persons who are interacting with one another in such a manner that each person influences and is influenced by each other person" or (Fisher, 1980, p. 22) as a "collection of individuals whose communicative behaviors.....become interstructured and repetitive in the form of predictable patterns."

2.1.1 The Importance of Rewards

Olson (1965, p. 51) has argued that "only a separate and selective incentive will stimulate a rational individual in a latent group to act in a group-oriented way." His position is based on the differences between individual versus collective action as each affects individual outcomes. While a person may perceive a direct link between his/her effort and the product or fruits of his/her labor when acting individually, this may not be the case in a group context. Since the group outcome cannot be provided by any one group member without being available to all group members, the

individual may not perceive that additional efforts on his/her part will result (at least directly) in additional benefit or gain to himself/herself. Alternatively, those returns may not be perceived as commensurate with the effort put forth, since they are shared by all group members. As a result, self-interest may not be served by acting in a group-oriented way, in that the good of all may be perceived by the individual group member to be at variance with his/her self-interest or personal welfare. This is analogous to what economists refer to as a "public good," a product or service that is consumed jointly by all, and for which there is no way of excluding non-paying customers.

A properly designed reward system can be used to make the irrationality of collective action more rational (Molm, 1980). A selective incentive (reward or punishment) must be provided which is sufficient in value to make the net gain to each individual from working toward a group goal exceed the cost of such cooperation (Oliver, 1980). Such an incentive is selective in the sense that it discriminates between those group members working for the group's interests and those who are not (Olson, 1965). Similarly, Marwell and Schmitt (1975) argue that rewards of sufficient size and frequency are a necessity for the maintenance of cooperative behaviors among group members (see also Tafoya, 1979; Komorita, Sweeney and Kravitz, 1980).

These incentives can be either task-related or interpersonal. A task-related reward is controlled by the organization and is

extrinsic in nature, while interpersonal rewards are more intrinsic, including social recognition, deference, being listened to, and facial gestures such as a smile. Collins and Guetzkow (1964, p. 74) indicate that it is these two sets of stimuli which "serve to mold, maintain, and motivate group behaviors." Of these two, it is task-related rewards which are emphasized in this research, in that these rewards are directly controllable by management.

Many task-related rewards which are applied to groups fail to provide the selective incentive necessary to achieve individual motivation. Collins and Guetzkow (1964) point out that often such rewards are allocated to an entire group equally, and thus the behaviors of specific individuals are not rewarded. Further, many group rewards are given only when the task is accomplished, and subsequently are not timely in terms of specific efforts or accomplishments. The degree to which such problems occur is a function of the type of task-related reward system in question. Thus, attention should be directed toward the more specific issue of how different types of reward systems affect group functioning.

2.1.2 Competitive, Cooperative and Independent Reward Systems and Group Performance

One major avenue small group research has taken involves the relative effects of competitive versus cooperative task-related reward structures on group performance where group members are task-interdependent. Table 2.1 is a summary of the major studies concerned with this relationship. As this research program has evolved

from the pioneering work of Deutsch (1949), a number of relatively consistent findings have been generated which warrant review.

Deutsch (1949) conducted experimental research which suggested that rewards which encourage cooperation, in comparison to competition, are likely to result in more coordination, division of labor, diversity in the amount of each member's contribution, achievement pressure, productivity, favorable evaluation of the group by its members, understanding of communications among group members, and incorporation of the attitude of the generalized other, among other group variables. His experiment involved placing students in groups which were asked to solve either puzzles or human relations problems over five weeks of an undergraduate psychology course. Cooperative rewards were given to groups based on observer evaluations of each group's deliberations and solution. The puzzle or human relations problem solutions were ranked from 1 to 5. The weekly scores for each group were averaged over the five weeks, and the group with the highest score was excused from part of the regularly required coursework. For the competitive reward, again using puzzles or human relations problems, each member of each group was evaluated during the group deliberations on a number of criteria. Members of a given group were ranked relative to one another, and the individual in each group with the highest average rating over five weeks was excused from part of the regularly required coursework. Correspondingly, Deutsch referred to a competitive social system as one in which a negative correlation exists between the goal attainments of the various group members, and a cooperative social situation

TABLE 2.1: KEY STUDIES RELATING COMPETITIVE, COOPERATIVE, AND INDEPENDENT REWARDS TO GROUP BEHAVIOR UNDER CONDITIONS OF HIGH AND/OR LOW INTERDEPENDENCY

	DEUTSCH (1949)	RAMOND AND COLARUS (1961)	HILLER AND HUBERLIN (1963)	RAVEN AND HUBERLIN (1963)	WEINSTEIN AND EICHEN (1963)	SCOTT AND CHERRINGTON (1973)	FRANCK, et al. (1977)	ROSENBAUM, et al. (1977)	OTTON AND DIVESA (1975)
Type of Reward Studied:									
Cooperative	X	X	X	X	X	X	X	X	X
Competitive	X					X	X		
Individual ^a					X				
Independent ^b		X	X		X	X	X	X	X
Mixed							X		
Dependent Variables:									
Group Performance	X	X	X	X	X	X	X	X	X
Group Process	X	X	X			X	X	X	X
Group Efficiency	X	X	X	X	X	X	X	X	X
Interpersonal Attractiveness	X			X	X				
Task-Related Satisfaction	X			X	X				
Group-Related Satisfaction	X			X	X				
Division of Labor	X					X	X		
Achievement Pressure	X		X						
Concern for Others	X							X	
General Arousal	X		X	X					
Moderator Variables:									
Inclusion of Multiple Contingencies ^c	X	X	X	X	X				
Inclusion of Conflicting Contingencies ^d	X	X	X	X					
Task-Interdependency		X	X	X	X	X	X	X	X
Goal-Interdependency	X		X						
Presence of Coacting Group	X							X	
Sample Population:									
Children						X			
College Students	X		X	X	X	X	X	X	X
Adults (non-students)		X							
Form of Reward:									
Points		X	X			X	X		
Money					X	X			
Course Credit	X								
Toys/prize			X			X			
Task Performed:									
Puzzles	X								
Discussion of Case Studies	X	X							
Determining Numbers			X					X	
Scoring Tests						X			
Coding					X				
Tower-Building with Blocks						X	X		
Leveling a Wooden Plane			X						
Level of Analysis:									
Individual		X	X			X			
Group	X	X	X	X	X	X	X	X	X
Inter-Group									X
Findings-Relationship Between Differential Rewarding and Group Performance:									
Inverse	X	X							
Positive									
Positive Under High and Low task Interdependence				X					
Inverse Under High Task Interdependence			X	X		X	X	X	
Positive Under Low Task Interdependence			X		X				

^a Given for individual performance in relation to some absolute standard

^b Given for individual performance in relation to overall group performance

^c An example of multiple contingencies would be where a person is rewarded both for group and individual performance

^d An example of conflicting contingencies created by a reward system might be where an individual faces the possibility that a given action on his/her part will increase the aggregate amount of the group reward (of which he/she will get a share), while also reducing the percentage (or share) of the group reward which he/she will receive

as one in which a positive correlation exists between group members' goal attainments.

Deutsch (1949) also emphasized that the typical group situation contains goals and sub-goals which represent elements of both competition and cooperation. Thus, it may be that members of a given (buying) group are cooperatively interrelated with respect to an overall goal, but competitively interrelated with respect to certain sub-goals.

Miller and Hamblin (1963) reviewed 24 studies concerned with competitive and cooperative elements in groups, and from this concluded that the relationship between competitive or cooperative rewards and group productivity is modified by the degree of functional or task-interdependency among group members. They present support from their own experimental research for a strong negative relationship between the amount of competitiveness encouraged by a reward system and productive efficiency in a group when functional interdependency is high, and a very weak positive relationship between competition and productive efficiency when there is little functional interdependence.

According to Miller and Hamblin, the degree of competitiveness refers to how much individual group members are rewarded separately, usually as a function of their contribution, and are encouraged to compete with one another to determine the magnitude each receives. In their experiment, rewards were given in the form of points for correctly determining which of a series of 13 numbers the experimenter

had chosen. Group members were isolated but could communicate. Groups started with 90 points and lost points as time elapsed. When all of the problems (numbers) were solved, the remaining points were allocated among group members. These were divided equally (cooperative reward) or as a function of the number of problems each had been the first to solve (competitive reward). The degree of competition was varied by changing the percentage of the reward given for coming in first, second, or third. If a group member chose to initiate communication with others (to cooperate), it generally meant the problems could be solved by the group in less time, but it also meant he/she would probably not be the first to solve a given problem. Group members were penalized for guessing.

Miller and Hamblin also found that, when group members were rewarded for their differential input in a task-interdependent situation, individual behavior alternated between cooperative and "blocking" (withholding information from other group members) as the individual attempted to achieve a balance between his/her desire for the reward and the need for group productivity. It should be noted that their operationalization of competitiveness is equivalent to the mixed-motive or independent reward scenario discussed below, and not to the zero-sum or purely competitive reward scenario.

A similar set of findings is found in Raven and Eachus (1963), who examined the effects of competitive and cooperative instructions on tasks where means-interdependence among group members was maximal (i.e., the performance of each participant was maximally determined

by the behavior of the other group members). The task involved three subjects leveling a triangular plane, with one subject sitting at each corner. Each subject controlled (with a knob) the heights of the other two corners, but not the corner at which he/she was seated. Subjects were evaluated either on how fast the group leveled the plane, or on how fast each could level his/her own corner. They found that the speed and efficiency of the group was higher, that there was greater positive evaluation of co-workers, greater personal motivation, greater willingness to accept leadership, and less hostility in the cooperatively independent groups than in the competitively interdependent groups.

Weinstein and Holzbach (1972) have questioned the findings of Miller and Hamblin (1963), suggesting that the low interdependence condition was improperly operationalized. They argue that the subjects under this condition were merely coacting individuals, rather than groups, because they faced no group goal. Weinstein and Holzbach address this problem with an experiment in which all members of the group benefitted from increased group output in both the cooperative and competitive reward conditions. The difference is that subjects got equal shares of the reward under the cooperative condition, while the better performers received a bigger share under the competitive condition. Thus, the competitive reward in this study was also a mixed-motive rather than a zero-sum or winner-take-all scenario. The task involved coding responses to a questionnaire on Opscan computer coding sheets. Their findings contradict Miller

and Hamblin, in that productivity was highest under the competitive reward in the presence of both high and low task interdependence.

An interpretation of the contradictory finding is found in Scott and Cherrington (1974), who argue that, in creating competitive conditions, researchers frequently include multiple conflicting contingencies. Multiple contingencies might be a situation where a group member can earn rewards both as a function of group performance and his/her individual performance. An example of conflicting contingencies in a task-interdependent situation would be where group members receive a larger reward if the group's overall performance is greater (which requires cooperation), but each member receives a smaller share of the overall reward unless he/she outperforms the others in the group. Thus, the conflict is between a group reward contingency and an individual reward contingency in the competitive condition. Where the researcher does not create a conflict between the reward the individual can achieve from overall group performance and those he/she can receive for individual performance, competition results in higher productivity than cooperation (Weinstein and Holzbach, 1972; Scott and Cherrington, 1974). Weinstein and Holzbach controlled for this conflict, while earlier studies inadvertently did not (e.g., Deutsch, 1949; Hammond and Goldman, 1961; Raven and Euchus, 1963).

Scott and Cherrington (1974) suggest that a better understanding of the effects of reward contingencies can be achieved by distinguishing between competitive, cooperative, and individualistic

rewards, and by not including either multiple or conflicting contingencies as part of any of the reward conditions. In their operationalization competitive rewards are contingent upon an individual's performance relative to that of others in the group. Cooperative rewards are contingent upon the performance of the group relative to other groups, where each group member receives an equal share. The individualistic reward is given to each group member in relation to some absolute standard. Scott and Cherrington found that competitive rewards that did not involve conflicting reinforcement conditions resulted in higher productivity, higher arousal, and lower interpersonal attraction than cooperative or individual rewards. However, their research involved a task (scoring tests individually) in which group members were not interdependent, and so their findings are applicable only to the low interdependency situation. Further, it is questionable whether Scott and Cherrington were actually working with groups rather than coacting individuals, except perhaps in the cooperative condition. This is especially the case under the individualistic reward, in which the individuals were rewarded for how many tests each scored relative to some absolute standard.

Using a task involving the stacking of wooden blocks into a single tower by a group, French, Brownell, Graziano, and Hartup (1977) examine the effects of competitive, cooperative, and independent rewards under conditions of high task-interdependence. The independent reward differs from the individualistic reward of Scott and Cherrington (1974) in that subjects are rewarded in direct

proportion to their contribution to the group product, rather than in relation to some absolute standard. The competitive condition of French, et al. involved a zero-sum or winner-take-all reward. They did not include multiple or conflicting contingencies. If the independent reward is considered as an intermediate condition between the competitive and cooperative rewards, the results of this study support the earlier theoretical contention of Miller and Hamblin of an inverse relation between productivity and differential rewarding in the presence of high task-interdependence. Differential rewarding in this context refers to any situation in which subjects are rewarded for individual efforts rather than receiving an equal share regardless of their contributions. The reward system becomes increasingly differential as one moves from the cooperative to the independent to the competitive condition.

French, et al. (1977) also examined the effects of reward structures on the group process. Process events included falls of the tower during the stacking activity, as well as role differentiation where one group member holds the shaky tower or straightens it as others continue to add blocks. Falls of the tower were more frequent in the competitive and independent conditions (possibly indicative of heightened arousal), while there was a greater tendency for role differentiation under the cooperative reward.

Noting that most reward structures contain a mixture of elements encouraging cooperation and competition, Rosenbaum, et al. (1980) examined the impacts of pure and mixed reward structures on group

productivity, while varying task interdependence. They used the block-stacking task (French, et al., 1977), but added instructions for the group to either build a single tower (high task interdependence) or for group members to build individual towers (low task interdependence). They found support for the strong negative relationship between differential rewarding (using pure reward systems) and productivity where task interdependence was high, and no relationship when it was low. A pure reward system might be one that is designed solely to encourage cooperation, such as where each actor receives the same reward based on group performance; or competition, such as where the top performing actor receives all of the reward; or independent, such as where each actor is rewarded solely in accordance with his/her own contribution in the immediately preceding work period.

In a separate experiment, Rosenbaum, et al. (1980) manipulated a reward system which included a mixture of competitive, independent, and cooperative elements. This was an attempt to extrapolate from the pure reward systems, used in all research to date, to a more realistic mixture found in typical organizations. It involved fairly complex calculations to arrive at each member's reward. Where a mixed cooperative-competitive system is utilized, it was found that the competitive component will have the dominant control on individual behavior, even when 80 percent of the reward is allocated cooperatively. They assert (p. 640) that

"one might posit that the addition of any amount of a competitive allocation to a cooperative reward

structure creates a psychological environment in which individuals view goal attainment by any one group member to be negatively correlated with goal attainment by others: Actions are no longer substitutable, role differentiation does not appear, and overt and covert sabotage lowers the productivity of the group."

A mixed competitive-cooperative system might be better conceptualized as a "social dilemma" (Dawes, 1980; Rosenbaum, et al., 1980). That is, seeking additional variable competitive rewards may come at the expense of the available cooperative reward. Dawes (1980) indicates that the competitive reward will be opted for in these circumstances. It should be noted that under high task interdependence, the independent reward effectively becomes a mixed reward, in that to achieve the reward the individual must cooperate to some degree (or the task cannot be accomplished), but also finds rewards are directly proportional to his/her individual performance or productivity. Thus, under an independent reward system, an analogous social dilemma may be present. Rosenbaum, et al. (1980, p. 641) suggest, in the presence of an independent system, that

"Certainly, combining efforts promotes the acquisition of rewards by all members of the group as in cooperative reward structures. However, any one individual's efforts result in a payoff only to that individual. It is thus difficult for an individual to consider the group product as a truly joint effort because rewards are distributed on the basis of individual efforts: The group is merely a medium for self-reward. Alternatively, independent reward structures only provide secondary reinforcement for working together with others because rewards for any given individual are not perfectly correlated with total group product."

Given this, the independent reward scenario will also be referred

to as a mixed-motive condition.

As with French, et al. (1977), these authors looked not only at how reward affected productivity, or group output, but also at group processes. For example, in the block-stacking task, they not only measured the number of blocks or the height reached by the tower in a specified time period, but also the number of times towers collapse, turn taking among group members, number of blocks handled (efficiency), and the discrepancy between the contribution of the group member with the greatest number of blocks and that member with the lowest amount (differential input). Less efficiency, more tower falls, and sabotaging occurred under a competitive reward system than under cooperative or independent systems. More turn taking occurred in the presence of cooperation-based rewards. No differences were found for the discrepancy measure. The results for the mixed reward systems involving competition were similar to those of pure competitive systems.

An alternative extension of the work of Miller and Hamblin (1963) is found in Okun and DiVesta (1975), who include the presence of a coacting group in their analysis. That is, they investigate the impact of competitive and cooperative rewards on group processes and performance, but also include the impact on the group of a second, coacting group. Both groups performed the same task at the same time, and it was the identical task used by Miller and Hamblin (1963). However, members of one group competed with members of the second group in some treatments, while in other treatments members of a

given group competed only with one another. Interdependency involved rewards rather than tasks, and was manipulated by making the allocation of rewards to members of one group a function of the performance of the second group. They found support for their proposition that the finding by Miller and Hamblin of a negative relationship between differential rewarding and group productivity could be extended to interdependent groups. Specifically, the strength of the negative relationship is substantially lessened when the group was dependently related to a co-group, but not when the co-group was independent. Okun and DiVesta conclude (1975, p. 616) that social processes in a group with a competitive reward system will be affected by any other coacting, interdependent groups. For example, an individual group member may find a combined cooperative-competitive strategy may best prosper his/her position in the initial group as well as his/her group's position vis-a-vis the second group. It should be kept in mind that, in their research, membership in coacting groups was mutually exclusive, and that groups were made interdependent by establishing competition between them rather than making them task-interdependent.

In summary, it appears not only that rewards play a vital role in creating the levels of competition and/or cooperation in a group, but that the type of reward system utilized will be a major determinant of process events and the performance of the group. Where pure reward systems are used (rather than those with multiple or competing contingencies), and where task interdependency is high,

it appears that groups are more productive under cooperative reward systems. Cooperative reward systems also tend to result in fewer errors, better coordination, more division of labor, higher levels of task-related satisfaction, and more interpersonal attractiveness than other reward systems under these conditions. Further, it would seem that other group processes, such as coalition formation, might also be affected by the reward system. In order to determine whether or not this is the case, and if so, the nature of the relationship, findings on rewards and coalitions are reviewed in the following section.

2.2 COALITIONS AND REWARD SYSTEMS

One of the most widely researched processes within groups is that of coalition formation, which is a strategy combining cooperative and competitive elements. Rapoport and Kahan (1976, p. 253) define a coalition as a "subset of a group in a negotiable mixed-motive conflict situation, which explicitly agrees to coordinate its efforts in the joint use of resources." Mixed motive refers to a situation requiring a combination of competition- and cooperation-oriented behaviors. Similarly, Gamson (1961, p. 373) explains that "coalitions are temporary, means-oriented alliances among individuals or groups which differ in goals," that coalition members usually demonstrate little value consensus, and they effectively agree to tacit neutrality on issues beyond the immediate purpose or object of the coalition.

A review of the literature dealing with coalitions reveals

the following major concerns: a) what factors give rise to individual decisions to join coalitions? b) what types of coalitions will form under different circumstances, and how can they be modeled? c) what is the set of stable equilibrium points for any given coalition formation situation? d) how will resources or payoffs be allocated among coalition members? e) what are the various bargaining processes that ensue from initiation of negotiations through coalition agreement and reward allocation? f) what factors will lead to defection from a coalition? and g) what are the predicted outcomes of empirical coalition formation and how can they be explained? The purpose of this section is to demonstrate the importance of reward systems in explaining coalitions. General findings on determinants of coalition formation are surveyed, and research efforts concerned with the impact of rewards are highlighted.

2.2.1 General Determinants of Coalition Formation

Adrien and Press (1968) argue that the decision to join a coalition is largely determined by the costs of that decision. They summarize eight categories of cost: information costs, responsibility costs, intergame costs, costs of division of payoffs, dissonance costs, inertia costs, time costs, and persuasion costs. Failure to treat many of these costs is an implicit drawback to much of the literature on game theory and coalition formation.

The acknowledgement of information costs by Adrien and Press contradicts the assumption in much coalition research of perfect information, both quantitatively and qualitatively. These costs

include collecting information regarding the strategies and value ordering of other group members, as well as the costs of communicating one's bargaining position and values to other group members. Responsibility costs refer to the cost of having the group decision attributed to the coalition, and they vary inversely with the required minimal size of a winning coalition. Inter-game costs refer to the notion that decision-making is an ongoing process, and opting to join a given coalition today may have opportunity costs in terms of some future decision. Division-of-payoffs costs refer to any loss in coalitional payoff to any individual as more people join the coalition. Dissonance costs result from the likely conflict within any coalition, which will escalate with the size of the coalition. The fact that many coalitions tend to persist once formed gives rise to incentive costs, which are those involved in altering an existing coalition pattern. The fact that coalitions often formally develop over some extended period gives rise to time costs. Finally, persuasion costs are those incurred when attempting to convince a reluctant but needed group member to join the coalition.

Most coalitional games are experimentally played by presenting a situation to subjects and requesting that they attempt to maximize gain, while imposing no explicit costs on them. The only costs included are the opportunity costs of pursuing one strategy over any others made available. Komorita and Brinberg (1977) have done some empirical work, however, in which cost conditions were imposed. That is, different types of monetary cost structures were imposed

on respondents in their quests for various rewards. They found that when the costs imposed were varied as a positive function of one's resource-power position, a significant effect on coalition formation resulted.

McGaffey (1976), in performing research on the motivational determinants of coalition formation, builds on the work of Vinacke (1969) using Atkinson's (1957) theory of achievement motivation. Where the decision to join various coalitions (or join no coalition) represented different levels of risk, McGaffey demonstrates that people whose motivations to succeed exceeded their motivations to avoid failure (two personality characteristics) opted to join fewer coalitions (a riskier strategy) or to join weak coalitions (moderate risk). Those with a stronger motivation to avoid failure pursued a low risk strategy of entering into more coalitions agreements, and stronger coalitions.

Hinckley (1979) discusses a person's attitudes towards winning and competition as major influences on the decision to engage in coalition formation. The perceived "likeness" or difference between two individuals, the differences in their relative status, and their experience in dealing with one another also appear to be important determinants (Lawler, 1975; Lawler and Youngs, 1975; Hinckley, 1979; Segal, 1979). Ashour (1975) has presented a model linking personality characteristics to partner preference, bargaining demands, and bargaining endurance as a function of a coalition's perceived probability of success. There is also evidence that a person's prior

bargaining experience affects coalition behavior (Chertkoff and Braden, 1974; Komorita and Kravitz, 1981).

A major influence on the decision to form a coalition, as well as with whom it will be formed, may be the network of communication links between and among group members (Francis, 1970; Kelley, 1968). Pool (1976) has investigated experimental groups in which members were not all able to communicate with one another, a possible characteristic of many buying centers. He was interested in how the manipulation of permitting or not permitting communication between various group members would affect both entry into a coalition and bargaining processes leading up to coalition formation. Where group members could communicate, he reports a significant relationship between those who took advantage of the opportunity to communicate and coalition partner choice. Further, coalition formation was more likely in the presence of two-way versus one-way communication, and the exclusion of a person from a coalition was more likely if that person was not linked to others in the coalition. He also finds a significant relationship between the number of channels of potential communication within a given coalition and its likelihood of being the winning coalition. Varying the importance of the message communicated did not affect these results.

In a separate study, Lawler (1975) suggests that the form of communication (face-to-face versus impersonal) affected coalitional agreements, and modified the relationship between group member status and willingness to participate in coalition activity. Chertkoff

and Braden (1974) found that coalition formation was affected by whether or not the bargaining communication was face-to-face and whether or not it was open or closed communication. Murnighan and Roth (1980) have found that the payoff to a person with veto power (must be included in any winning coalition) increases as communication possibilities between actors are reduced, and as group size increases.

Early research placed emphasis on the relative power or resource positions of group members as a determinant of coalition formation (Shapley and Shubik, 1954; Caplow, 1956; Gamson, 1961; Caplow, 1968; Chertkoff, 1971; Michener and Lyons, 1972; Chertkoff, 1974; Messe, Vallacher and Phillips, 1975). Often using groups with three members (triads), coalitions were expected to form between the weaker group members against the stronger, or mutually acceptable agreements were negotiated between group members of differing resource/power positions concerning possible side-payments and the relative distribution of payoffs.

More recently, it is the payoffs or rewards themselves that have been emphasized as the critical factor behind coalition formation. That is, the decision to join a coalition is predominantly influenced by the size of the payoff that coalition can expect to receive, and the distribution of that payoff among coalition members. The following section expands on the relationship between rewards, as an independent variable, and coalition formation, as a dependent variable.

2.2.2 Rewards as Determinants of Coalitions

2.2.2.1 Norms Concerning Reward Distribution

Research on coalition formation has concentrated on developing and testing models which will predict the size and membership of the coalitions which will form as a function of some key determinant, such as those discussed in the preceding section. One can distinguish between mathematical and social psychological models of coalition formation, with the former being termed game-theoretic models by Rapoport, et al. (1979). Game-theoretic models are based on the assumption of consumer rationality (the player has perfect information and maximizes expected utility), and have the purpose of identifying equilibrium positions for a given type of coalition as well as predicting outcomes of empirically modeled coalitions.

Roth (1979, p. 515) indicates that "traditional game theory solutions are restricted by the assumption of external symmetry, which requires that any factor not relevant to the logical structure of the game should not be taken into account," and that game theory is basically prescriptive in nature (see also Mazur, 1968). Given this lack of realism, and the difficulty in extrapolating the findings to real-world groups or circumstances, social psychological approaches constitute the largest share of current research efforts on coalitions. It can be noted, however, that most of the currently accepted social psychological models are built around certain normative assumptions. Table 2.2 is a summary of some of these models and their assumptions. These are norms regarding the distribution

Table 2.2: Major Social Psychological Models of Coalition Formation and Their Underlying Normative Assumptions Regarding Rewards

Type of Model	Source/Year	Principal Reason for joining a Coalition	Basis for Reward Distribution	Reward Norm
Minimum Resource	Gamson(1961)	Combine the Minimal Amount of Resources Necessary to Win	Resource Contribution	Equity ^a
Minimum Power	Shapley and Shubik (1954); Gamson(1964)	Achieve the Minimal Amount of Combined Pivotal Power ^b	Ability to Determine the Winning Coalition by Joining or Withdrawing	Equity
Bargaining	Komorita and Chertkoff (1973)	Maximize Expected Payoff Over Time	Negotiated Balance Between Amount Each Individual Could Make in Alternative Coalitions and an Equal Division to all Members of the Coalition ^c	Equality and Equity
Weighted Probability	Komorita(1974)	Minimize size of Coalition Necessary to Win	The Absolute Number of Alternative Winning Coalitions a Person Could Join	Equity
Equal Excess	Komorita(1979)	Equal or Surpass the Best Reward Alternative Available in Previous Trials	Initially Equal but Modified over Trials Based on Demand for Each Member of the Coalition by non-members	Equality and Equity

^a Equity is analogous to parity, and involves distributing rewards based on a person's importance or contribution to a given coalition.

^b Pivotal power refers to the ability of a person to change a large proportion of possible winning coalitions into losing coalitions by withdrawing from them.

^c Under both the bargaining model and the equal excess model, it is expected that payoff distributions change over trials of a game, as people acquire bargaining experience.

^d Under the equal excess model, payoffs are divided proportionately based on the best reward alternative each person had in the previous round of the game. Any excess of rewards over the amount all members of a given coalition could have received in the previous round is divided equally among the members. In the first round, the entire reward is divided equally.

of payoffs or rewards among coalition members, and the two most common are a norm of equity and a norm of equality.

The key point, then, is that the quest for rewards is assumed to be the underlying dynamic in most of the models of coalition formation in use today. For example, Gamson's (1961) "minimum resource theory" is based on a norm of equity or parity, where payoffs are allocated in proportion to the relative resource contributions of individual coalition members. It predicts that the coalition which forms should consist of the minimum amount of combined resources necessary to win. Similarly, "minimum power theory" (Shapley and Shubik, 1954; Gamson, 1964) asserts a distribution of payoffs in relation to an individual's pivotal power, or the ability of that individual to determine the winning coalition by his/her decision to join or withdraw from a given coalition. Alternatively, "bargaining theory" (Komorita and Chertkoff, 1973) rests on both a norm of equity and a norm of equality. Here, coalition members who are weaker in terms of their resource positions bargain with those who are stronger. The former urge that all coalition members get an equal share of the payoffs, while the latter argue that payoffs be allocated according to resource contributions. Initially, the individual allocations are the average of these two extremes, and the coalition which forms will be the one providing the highest average to the individual. Over time, however, members become aware of what they could make in alternative coalitions, and use this for bargaining leverage to change payoff allocations. The coalition

which forms over time, then, is predicted to be the one where a member will have the least temptation to leave for an alternative. A final example can be found in Komorita's (1974) "weighted probability model," which is based on the negative relationship between group size and cohesiveness (Riker, 1962; Cartwright and Zander, 1968). Because larger coalitions are more difficult to form and to manage, a norm of equity prevails in which payoffs are given to an individual as a function of how many alternative winning coalitions that person could join.

The importance of norms as determinants of coalition formation can also be seen in the work of a number of other researchers. For example, Chertkoff and Esser (1977) explicitly assume that norms of equity and equality lie behind coalition formation in their evaluations of various models when short- versus long-term coalitional agreements are possible. Messe, Vallacher and Phillips (1975) empirically demonstrate an equity theory (Adams, 1965) or norm of equity explanation for the formation of conservative coalitions in triads. Conservative coalitions are between the two stronger parties, while revolutionary coalitions are between the relatively weaker in attempting to overcome the stronger. Parcel and Cook (1977) use a norm of equity to link task performance to status hierarchies and differential rewards in coalitions (see also Komorita and Brinberg, 1977). Morgan and Sawyer (1979) demonstrate that norms of equity and equality determine both outcomes and procedure in social exchange. Roth (1979, p.536) argues that "subjects are not the vacuous automata

of the game theoretical model; they do take social norms into account. Neither are they immune to the rational demands of their own self-interest." He indicates that different sources of entitlement give rise to different norms of distribution. For example, effort expended by a member of a group, or resources controlled by members of a group, may give rise to a norm of parity or equity, while the size of the constituency one represents may give rise to a norm based on need, and one's competitive bargaining advantage may give rise to a norm of rationality (i.e., maximizing gain). It should be noted that complex bargaining settings may involve a mixture of normative motives, and thus outcomes become more predictable.

Other research has been directed at demonstrating that rewards themselves, in addition to the norms which guide their distribution, have a direct causal impact on coalition formation.

2.2.2.2 The Nature of the Relationship Between Rewards and Coalitions

While a relatively small number of studies have been specifically directed at the nature of the linkage between rewards and coalitions, there is a developing body of consistent findings regarding the importance of this relationship. Table 2.3 is a summary of studies in which rewards are conceptualized as the independent variable. It should be noted that most of these studies measure coalition behavior in terms of which coalitions form from among a number of possibilities, as well as the division of rewards in those coalitions. That is, it is not usually a question of whether or not coalitions form at all, but rather a question of which sets of individuals will coalesce. Folkes and Weiner (1977) indicate,

Table 2.3: Key Studies Relating Rewards to Coalition Behavior

	Lawler and Lounsbury (1973)	Mapoport and Kahana (1976)	Folkes and Weiner (1977)	Murnighan, et al. (1977)	Komorita (1980)	Kravitz (1981)	Komorita and Kravitz (1981)
Type of Reward Examined:							
.Constant Sum ^a					x	x	
.Variable Sum ^a	x	x	x	x			x
.Extrinsic	x	x	x	x	x	x	x
.Intrinsic		x					
.Competitive			x				
Dependent Variables:							
.Frequency of Specific Types of Coalition	x	x	x	x	x	x	x
.Attractiveness of Different Coalitions	x	x					
.Distribution of Payoffs		x	x	x	x	x	x
.Demands of Players		x					
.Frequency of Initial Offers Made by Each Person		x		x			
.Deviation Between Predicted and Observed Payoff Values ^b		x	x	x			x
.Interpersonal Conflict		x					
.Bargaining Process	x						
Moderating Variables:							
.Bargaining Experience							x
.Presence of a Reference Group							
.Size of Group			x			x	
.Communication Rules		x					
.Resource Positions of Subjects ^c			x	x	x	x	
.Perceived Utility of Coalitions							
.Anticipated Conflict	x						
.Ability/Skill of Subjects			x				
.Size of Possible Winning Coalitions						x	
.Quota Value ^d						x	x
Sample Population:							
.Students	x	x	x	x	x	x	x
.Non-students		x					
Size of Group:							
.Three-Person	x	x	x				x
.Four-Person				x	x	x	
Form of Rewards:							
.Points			x				
.Points Exchangeable for Prizes or Money		x		x	x	x	x
.Points Exchangeable for Course Credit				x	x		
.Money			x				x
.Political Patronage	x						
Task Performed:							
.Board Game (e.g., Parchisi)		x					
.Legislators Try to Form Majority			x	x	x	x	
.Business Managers Forming Mergers							x
.Candidates Vying for Presidential Nomination	x						
.Computerized Game	x						
Special Stipulation of the Coalition Exercise:							
.Coalition Had to Form							
.Grand Coalition Could Form	x						
.Coalitions Were Encouraged	x	x	x	x	x	x	x
.Open Bargaining ^e	x			x	x	x	x
.Closed Bargaining	x		x				
.Time Restriction				x			x
.Deadlocks were Possible			x	x	x	x	x
.Repeated Trials Were Used	x		x	x	x	x	x
Key Findings—Rewards and Coalitions:							
.Coalition Behavior Significantly Affected by Size of Reward and/or Size of Individual Share ^x	x	x	x	x	x	x	
.Coalition Behavior Significantly Affected by Type of Reward		x	x				

^a Constant sum or simple games involve providing the same payoff to any winning coalition; Variable sum games provide different-sized payoffs to different winning coalitions.

^b A number of these studies were concerned with the predictive accuracy of various models of coalition formation under differing conditions. As a result, they included the deviation between predictions of those models and the actual payoff distribution observed in the experiment as a dependent variable.

^c While some studies conceptualize resource/power positions as an independent variable, most subsequently evaluate this as a moderating variable when examining the impact of rewards.

^d To change the quota value is to vary the size of the majority necessary to achieve a winning coalition.

^e Bargaining is open if all group members know of any coalition offers or proposals made among individuals in the group; In closed bargaining, only the parties involved in a potential coalition know of the offers relating to that potential coalition

however, that the variables which lead individuals to form coalitions also determine which coalitions will form. As a result, the term "coalition formation," as used in this discussion, refers both to the basic decision to coalesce, as well as to the decision concerning with whom one chooses to coalesce.

Lawler and Youngs (1975) have developed a recursive causal model of coalition formation, positing three independent variables and two intervening variables. Independent variables included the individual's anticipated rewards from a coalition, his estimation of the coalition's probability of success in obtaining one's objectives, and the extent of attitudinal agreement among potential coalition members. These affect coalition formation through the moderating influence of the perceived utility or valence individuals have regarding various group outcomes (in the case of probability of success and rewards), and anticipated conflict with others in the coalition (in the case of attitudinal agreement and rewards). In testing this model, these authors report that direct linkages from the three independent variables to coalition formation were significant, with attitudinal agreement having the strongest relationship. When the moderating variables are included, greater reward and higher probabilities of success increased perceived utility, which subsequently influenced the coalition decision of an individual.

Lawler and Youngs manipulated the size of the reward in an experiment where students played the role of a political candidate at a nominating convention who could not win the nomination, but

could determine who did win by coalescing. They varied rewards by changing the percentage of the total payoff or patronage that the subjects could receive in a coalition with each of the leading candidates.

The size of rewards has largely been ignored in formal attempts to evaluate coalition models. While the bulk of empirical research on coalition formation has concentrated on testing such models (e.g., the minimum resource model, the minimum power model, the bargaining model, the weighted probability model), most of these have focused on the implications of resource differentials among individuals (see Cherkoff, 1974; Miller, 1980). Hinckley (1979), in a review of the literature, found that rewards are built into most coalition games, but are not manipulated as a variable. She emphasizes that most real-world group situations involve rewards of differing sizes to various alternative coalitions (see also Miller, 1980). Only recently has the size of rewards been empirically manipulated (Rapoport and Kahan, 1976; Komorita and Tuminis, 1980; Miller, 1980; Komorita and Kravitz, 1981). Yet, in research where rewards are varied, rewards or payoffs appear to play a consistently more important role in explaining and predicting coalitions than the resource/power positions of the various group members (Kravitz, 1981).

In a test of four models of coalition formation, Miller (1980) varied both the resource/power positions of group members and the possible reward payoffs to various coalitions. Subjects played the role of legislators in four-person groups, where each group

member controlled a certain amount of votes. The legislators were encouraged to form coalitions, and the coalition which controlled a two-thirds majority of the votes was the winner for any given group. In some games, all legislators had equal resource positions (controlled the same amount of votes), while in others, this was varied. Similarly, in some games all winning coalitions received the same payoff, while in others the payoff was varied as a function of which coalition won. Subjects were provided with payoff tables indicating the number of points each of the possible winning coalitions could earn. A prize was given to the person earning the most points over a number of trials. In the bargaining process, subjects made proposals on written slips concerning which coalitions each wanted to form, and how rewards should be divided among the members of that proposed coalition. Where resource positions were unequal, but the size of rewards to winning coalitions not varied, Miller found that resources affected the frequency with which various coalitions formed and the division of rewards within coalitions, but not the frequency of initial offers to form a given coalition. Where resources were equal but rewards were varied, reward differences affected the frequency of initial offers, the frequency with which various coalitions formed, and the division of payoffs. Finally, where both resource positions and coalition payoffs are varied, Miller suggests (p. 162) that "...individuals will attend mostly to the differences in payoffs rather than the differences in resources."

In an experiment involving a similar task, Komorita and Tuminis (1980) also varied the prize for various coalitions and the resource positions of subjects in four-person groups. In this case, however, legislators needed to form a majority coalition necessary to pass a bill. Points were given to winning coalitions to divide among the members in accord with their bargaining agreements. The study also differed in that all subjects could exchange the points they earned for prizes (e.g., ball-point pens, pencils, and other supplies), and the subjects were told that the conversion rate of points for prizes for each person was dependent upon comparisons with the performance of subjects in previous experiments that held the same resource position. As with the Miller study, the resource weights proved to have a negligible effect on coalition formation, while the magnitude of the rewards available to a person from various coalition alternatives was the crucial factor in explaining coalitions. Komorita and Tuminis indicate that the size of these reward alternatives is the major determinant of a person's bargaining strength.

In addition to the size of the rewards, it is important to investigate the impact of different types of reward systems. Folkes and Weiner (1977) examine the coalitional behavior of individuals with high, medium, and low resources as a function of their motivation toward intrinsic rewards, extrinsic rewards, or a mixture of the two. Using an experiment with triadic groups, the extrinsic motivation (and reward) condition found the low and medium resource

subjects forming a coalition to the exclusion of, and contrary to the wishes of, the high resource person. The intrinsic motivation (and reward) condition was associated with the same coalition being preferred, but all actors were relatively happy with this outcome. Thus, there were no interpersonal conflicts and correspondent pressures to bargain. This is because the competition between the high resource person and a coalition of the medium and low resource persons was viewed by participants as a task of intermediate difficulty and as the situation where competition was most equal. The authors define intrinsic motivation in terms of seeking and conquering challenges, and thus it is related to achievement motivation.

Folkes and Weiner conclude that both coalition formation and interpersonal conflict are dependent upon the types of rewards available to groups. Their experiment involved students moving markers around a board game in accord with the throw of a die. They were able to multiply the number on the die by a number drawn from a hat to determine the number of spaces moved. However, by forming coalitions, they could add the numbers drawn by each coalition partner and take the sum times the number on the die. The extrinsic reward was a monetary value, while the intrinsic reward involved points. While the authors argue that these points were only symbolic, and thus intrinsic, it is not clear how well they represent intrinsic motivation. Among other things, the points represented a tangible goal set by those managing the game, rather than being internally determined by the subjects. It should also be noted that interpersonal

conflict, as measured in this study, was determined solely as a function of the amount of agreement among members of a triad concerning which coalitions should form. Nonetheless, this is the only study to explicitly model both conflict and coalition formation as dependent upon rewards.

There has been little additional work on the effects of different types of reward systems on coalition formation (see Komorita and Kravitz, 1981), and none expressly on the effects of competitive versus cooperative rewards. However, Murnighan, Komorita and Szwajkowski (1977) have, in effect, manipulated a type of competitive reward system in their research on the influence of reference groups on coalition formation. They conducted an experiment in which students with differing resource positions (the number of votes they controlled) were placed in four-person groups and asked to assume they were legislative leaders attempting to form a majority coalition. The winning coalition (first to achieve a majority) in each trial received 100 points to divide based on the bargaining agreement among coalition members, and a number of trials were used. At the end of all the trials, money was exchanged for points in one of two ways.

Groups under one treatment condition were told that each person would receive money in relation to how many total points he/she earned based on an unspecified (to the subjects) conversion scale. That is, the more points they earned, the more money they would receive, but the exact rate of conversion was unspecified. In the

other treatment condition, subjects were also told that they would receive more money as their point total increased, but that the conversion scale of money for points would be different for each person in a four-person group. Specifically, each subject would earn money as a function of how well that person did in his/her group compared to the performance of similar others in other groups. Similar others were people in separate groups having the same amount of resources as the person in question.

By using reference groups in designing the rewards, Murnighan, Komorita and Szwajkowski effectively manipulated the amount of competition built into the reward system. It is difficult to draw a direct link between coalitions and the "competitive" reward in this study, though, because coalitions had to form in order to earn any points. However, it was demonstrated that four of the major models of coalition formation were able to make significantly more accurate predictions concerning which coalitions would form and how payoffs would be distributed in the more competitive (reference group) condition. In fact, all models of coalition formation assume competitive motives, and that people seek to maximize their share of the available rewards. Thus, it appears that coalition behavior may be strongly affected by the level of competition built into the reward system.

Despite the lack of additional research on the effects of different types of rewards, there would seem to be a foundation in the literature for drawing a theoretical link between cooperative, competitive, and independent rewards systems and coalition behavior

in groups. As was demonstrated in section 2.1.2, both group process and group productivity vary significantly in response to cooperative, competitive, and independent reward structures (Deutsch, 1949; Hammond and Goldman, 1961; Miller and Hamblin, 1963; Raven and Euchus, 1963; Weinstein and Holzbach, 1972; Scott and Cherrington, 1974; French, et al., 1977; Rosenbaum, et al., 1980). Further, it has been demonstrated that rewards are a primary determinant of coalition formation. A coalition was defined earlier as a mixed-motive-strategy within group. That is, it represents a combination of competitive and cooperative behaviors, where one forms cooperative alliances with others to enhance his/her competitive position in the larger group. Thus, it follows that coalitions should be especially likely under reward structures which create a mixed-motive scenario.

In ensuing sections, a formal model and testably hypotheses concerning the possible relationships between competitive, cooperative, and independent reward systems and coalitions are presented. Before doing so, however, implications of these findings on the interrelationships between rewards, groups and coalition behavior are drawn to provide insight into the dynamics of organizational buying behavior, and specifically, processes within the buying center.

2.3 PURCHASING AS GROUP BEHAVIOR: THE ROLES OF REWARDS AND COALITIONS

2.3.1 The Purchasing Function

The buying process is typically viewed from the perspective of the purchasing department, although a number of exceptions exist

(e.g., Kiser, Rao, and Rao, 1975). Purchasing is increasingly becoming a top-level management position as the realities of resource scarcity, inflation, and government regulation have become a fact of life. This combines with the fact that, on average, purchases account for 50-60 percent of the sales revenue in a given industrial company (Upah and Bird, 1980). Formal company purchasing operations typically consist of a number of positions (e.g., vice-president for purchasing, materials manager, purchasing manager, general purchasing agent, purchasing agent, senior buyer, buyer, and expeditor), and demonstrate considerable variation in terms of age, experience, years with the firm, education, professional affiliations, and technical orientation, of members (Pasuraman, 1981; Peters and Venkatesan, 1973; Sweeney, Mathews, and Wilson, 1973). The purchasing operation generally consists of five categories of activities: administration (e.g., developing policies, procedures, and controls), buying, expediting, special staff work (e.g., value analysis, market research, cost studies) and clerical (e.g., writing orders, maintaining vendor files) (Lee and Dobler, 1977). Importantly, purchasing professionals are rewarded on a number of different bases. For example, Corey (1978a) cites three prime criteria for evaluating purchasing: ability to facilitate needs of user locations by assuring on-time deliveries of parts and materials that meet quality requirements; ability to negotiate acceptable prices; and, ability to conform to purchasing norms and expectations (e.g., no conflicts of interest, proper documentation). He notes that evaluations often tend to be in qualitative

rather than quantitative terms. Separately, Corey (1978b) notes more specific performance criteria such as paying market price, meeting schedules, negotiating skills, follow-up and rapport with engineering. Anderson (1981) mentions reward criteria such as time spent on prenegotiation preparation and bid solicitation, and the building and maintenance of ongoing relationships with numerous suppliers. Bonoma (1982) cites an example of purchasing agents rewarded not for the net price they paid but for the amount deducted from the price during negotiations.

Purchasing department members appear to demonstrate a significant amount of role conflict. For example, Weigand (1966) compares the concern purchasing agents claimed they had for various elements of a given product (e.g., design, cost, performance) to perceptions executives from other departments had of purchasing's responsibilities in these areas. He found considerable disagreement. Gorman (1971) also presents evidence of extensive conflict between purchasing managers and functional area managers in terms of role conceptions for the purchasing department. He notes that this is due to three factors:

1. Interdependencies between the purchasing and functional departments, in that neither can handle the entire purchasing function without the other;
2. Differences in group goals, with purchasing striving to save the firm money by following purchasing tenets which conflict with functional department efficiency goals of a different sort;
3. Differences in perception of reality depending on the predispositions of each group (Gorman, 1971, p. 70).

It is his opinion that this inter-departmental conflict does not reach a destructive level in most organizations, and that rarely do individuals take overt action to undermine one another. Gorman also found an internal group consensus within purchasing concerning the existence of a discrepancy between their view of what their role should be as opposed to their actual role within their respective firms. Parasuraman (1981), in examining role clarity and satisfaction of purchasing professionals, found that they appear to have a clearer feel for individually perceived informal role responsibilities than for formally stated policies.

The purchasing department has been viewed principally as fulfilling a service function to other departments in the organization, such as production, marketing, and engineering. As mentioned above, Corey (1978b) stresses upper management's concern with how well the purchasing department facilitates the needs and objectives of other firm functions. At the same time, it is interdependent with a number of departments at the same horizontal or lateral level, such as planning, accounting, computer services, research and development, and finance. It also competes with some of these functional departments for status and other scarce organizational resources, as illustrated by Strauss (1962; 1964). Bird and Mazze (1976) have argued that any functional areas interacting with purchasing, such as those above, as well as vendors, consultants, and upper-level management, have important vantage points from which to evaluate purchasing. In an industrial context, an engineering or technical

perspective often pervades managerial decision-making. As a result, purchasing department members cannot accomplish departmental objectives without serving organization needs. Moreover, McMillan (1973) notes that purchasing is frequently not the most influential voice in buying decisions, and that purchasing department members tend to rate themselves as more influential than others in the firm rate them. The apparent conflicts regarding both the role and influence of purchasing might be better understood with a more complete discussion of the buying center.

2.3.2 The Buying Center

The complexities of organizational purchasing processes may be more easily dealt with if considered within the context of group behavior. The whole notion of a "buying center," or "decision-making unit" (in Wind and Cardozo, 1974), assumes some social or group interaction in arriving at a decision concerning a product or vendor. The buying center construct was defined earlier in terms of a set of roles (i.e., buyer, user, influencer, etc.). Again, it refers to all the individuals and groups involved in the buying decision process, who share some common goals and risks arising from these decisions (Bagozzi, 1978, p. 100). As indicated by Wind (1978, p. 67), "The concept of the buying center has been accepted in principle. Yet in practice it has been rarely applied beyond its intuitive utilization by salesmen who, in the course of their selling efforts, do frequently establish contacts with a number of organizational members and groups." It is, of course, relevant in the many

instances where decisions are made jointly. As McMillan (1973, p. 207) stresses, "Industrial buying behavior is best conceptualized as a form of decision making involving several members of the firm who are collectively called the buying center."

Membership in the buying center varies over the stages of the buying process (i.e., need recognition, information search, bid negotiations, etc.), and has been demonstrated to include such departments in an industrial firm as engineering, production, quality control, marketing, product planning, scheduling/traffic, inventory control, legal, administration, research and development, and maintenance. Estimates of the size of the buying center range from 1.5 (Patchen, 1974) to 3.5 (Buskirk, 1970) and 5.5 (Laczniak, 1979), while Weigand (1964) cites a range of 8.9 to 11.9, and Spekman and Stern's (1979) examination of 21 industries found their buying centers varying anywhere between 3.0 and 8.0 members. Wilson emphasizes significant differences between individuals acting in a buying center context versus individuals acting in their own behalf as consumers. He indicates (1978, p. 32) "In addition to obvious organizational constraints, there is the fact that many problems are divided into subproblems, and different individuals are assigned responsibility for each subproblem. For example, quality problems may be assigned to engineering, delivery assigned to production, and terms of purchase to the purchasing department. Individuals are also highly trained to perform their tasks, which is not the usual consumer situation." Moreover, the composition of the buying center tends

to be commodity specific, varying with the type of commodity purchased (Spekman, 1978).

The buying center has been defined as group behavior involving a set of interacting and evolving roles. It should be noted that each individual in any group performs some role within a network of roles (Fisher, 1980, p. 172). A role can be defined (Hare, 1976, p. 131) as "the set of expectations which group members share concerning the behavior of a person who occupies a given position in the group." Thus, a role is defined both in terms of a position apart from any one individual and in terms of behaviors performed by a person in that role. In an industrial buying center, the set of roles or social tasks "can be thought of as a fixed set of behavioral pigeonholes into which different managers from different functions can be placed to aid understanding." Calder (1977; 1978) has performed some initial research on the use of role theory for the analysis of structural relationships within the buying center.

A number of structural dimensions have been identified in the buying center, where structure refers to the configuration of a communication network not formally determined by the organization, but by the fairly consistent communication linkages among the relevant individuals. These linkages are indicators of the identities and inter-relationships among those involved. Johnston and Bonoma (1981) identify five such structural dimension: vertical involvement of different levels of the organizational hierarchy; lateral involvement of functional areas at the same level; extensivity, or the

total number of people involved; connectedness of members by direct communication linkages; and the centrality of the purchasing manager to the overall flow of communications regarding a specific purchase.

An alternative approach to structure in buying centers which is grounded in organization theory is provided by Spekman and Stern (1979). They utilize a "macro-sociological approach" (Spekman, 1978) based on the contingency theories of organization structure. Of concern is the efficiency of communication flows for the information processing needs of the firm. Given that the structure of the buying center impacts upon communication flows, this structure should react to the environmental threats posed by a given purchasing situation. Thus, where environmental uncertainty is high, information needs dictate that the buying center demonstrate less centralization, less division of labor, a lower degree of formal rules and procedures, and greater participation in decision-making by group members.

Given the inter-functional involvement in buying processes, a major stream of research has been on means of identifying major sources of influence in the buying center, a largely managerial concern (Brand, 1972; Cooley, Jackson, and Ostrom, 1978; Gronhaug, 1976; Hillier, 1975; McMillan, 1973; Patchen, 1974; Silk and Kalwani, 1982; Webster and Wind, 1972; Weigand, 1966). The identification of participants does not appear to be a difficult feat, with some variation of a snowball sampling technique frequently relied upon (see Moriarty and Bateson, 1982, for a review and fairly thorough

discussion of studies using this technique). Silk and Kalwani (1982) have analyzed the validity and reliability of previous measures used to ascertain participation and influence in buying centers. They find serious shortcomings in the methods used to measure influence, in that these measures are overly global. That is, they do not discriminate among "the myriad of events and interactions distributed over time" which constitute the stages in the buying process (Silk and Kalwani, 1982, p. 179). Further, knowledge about the sources and magnitude of systematic and random errors of measurement, as well as means to improve measurement, is quite limited. As Johnston and Bonoma (1981, p. 144) have concluded, "Apparently it is quite easy to identify buying center participants in any given purchase situation, but quite difficult to understand their dynamics and power relationships." Separately, Bonoma (1982) suggests that there is no correlation between a given manager's functional area and his/her power in the organization. An example of a source of influence which is a complicating dynamic is the formation of coalitions in the buying center, which will be discussed below.

Extreme difficulties exist in efforts to generalize across organizations in industrial buying behavior research. Bonoma and Zaltman (1978, p. 29) explain:

"For one thing, buying centers are not the same in composition or strategy either across different industries or within one industry. Also, the composition of the buying center and buying strategies will be found to vary significantly by product class, type, size of the firm doing the buying, and size of the firm doing the selling."

They assert that such generalization will only be possible when such behavioral and transactionally focused sciences as sociology and social psychology are incorporated into the extant marketing research. This dissertation research strives to make a contribution in this regard.

Up to this point, an implicit assumption has been made that the behavior of buying center participants was, in fact, group behavior. The relevancy of the social psychology literature hinges, in part, on the legitimacy of such an assumption. That the buying center is a group can be seen in reviewing the five criteria established by Alderfer and Smith for "groups in organizations." They indicate (1982, p. 38),

"A human group is a collection of individuals (1) who have significantly interdependent relations with each other, (2) who perceive themselves by reliably distinguishing members, (3) whose group identity is recognized by non-members, (4) who, as group members acting alone or in concert, have significantly interdependent relations with other groups, and (5) whose roles in the group are therefore a function of expectations from themselves, from other members, and from nongroup members."

These criteria directly apply to the buying center. As discussed earlier, the accomplishment of the buying task requires inputs from a number of functional areas in the firm, thus making them interdependent. The commonly accepted approach to identification of members involves asking those obviously involved to identify all the relevant others, indicating that members can be distinguished from non-members. Silk and Kalwani, in reviewing the empirical literature, report high consensus among informants concerning the identity of

buying center participants. Alderfer and Smith (1982, p. 38) emphasize that recognition by non-members does not have to be formal or legal, but only psychological. By definition, this is the case with the buying center. The interdependence between buying center members and other groups and the subsequent influence of both group and nongroup members' expectations on those in the buying center are thought to be extensive, and are the basic precepts underlying this dissertation research.

2.3.3 Rewards and the Buying Center

The members of a buying center may demonstrate considerable differences in terms of the product or vendor attributes which they feel should be emphasized in a given purchase decision. These disagreements can be related to differences in individual motivation. Motivation, in turn, can be explained in terms of expectancy theory. The reward and measurement system which an individual faces becomes a key factor in his/her behavior. Because the primary work group (department or functional area) represents the major source of these rewards, it is instrumental in explaining the positions taken by an individual in the buying center.

Lehmann and O'Shaugnessy (1974) demonstrate that purchasing agents emphasize different attributes or goals as a function of the type of problem the purchase poses for the organization, with a number of attributes consistently important. Kiser, Rao, and Rao (1975) have found that non-purchasing members of the buying center clearly stress certain attributes over others, regardless of the

type of purchase. They indicate (1975, p. 53) that "the nature, dimensions and intensity of perceptual similarities and differences in vendor attributes measure to some degree the extent of inter-executive and inter-departmental conflict in the industrial buying process." The implication here is that the importance an individual places on a given attribute is determined, at least in part, by the functional area in the firm to which he/she belongs. Moreover, Bonoma (1982) has linked attribute preference to individual motivation. It would appear, then, that individual motivation is affected by variables related to one's department or functional area in the firm, and that buying center conflict may result from differences in motivation among the relevant actors. This is the position taken in this research, and its validity can be explained in terms of expectancy theory, which Nadler and Lawler (1977, p. 26) term "the most comprehensive, valid, and useful approach to understanding motivation."

The expectancy theory of motivation (Galbraith and Cummings, 1967; Graen, 1969; Mitchell and Biglan, 1971; Porter and Lawler, 1968; Vroom, 1964) posits that an individual's motivation toward performing some behavior is a function of the degree to which the individual perceives the behavior as being instrumental in obtaining some desired outcome. Motivation, definitionally, is concerned with the conditions that explain variations in the intensity, generality, and the direction of individual behavior on a continuing basis (Vinacke, 1962). The components of expectancy theory include

first and second level outcomes, valences for various outcomes, an instrumentality component, and an expectancy component.

In a work context, first level outcomes generally refer to task performance, performance outcomes, or, in Anderson's (1981) terms, an improved rating on some reward criterion included in the organization's measurement system. While task performance results from effort, performance outcomes are additionally affected by individual abilities and by role perceptions (Porter and Lawler, 1968). Graen (1969) refers to a first-level outcome as a "work role," or set of behaviors the organization deems appropriate for the incumbent individual in some position (e.g., member of some department). These roles are attained and kept by meeting the minimum standards of appropriate behavior as evaluated by some external agent or supervisor, and examples include "effective job performer" and "team member."

Second-level outcomes are events that first-level outcomes should be instrumental in attaining. Galbraith and Cummings (1967) discuss three performance-related sets of second-level outcomes: (1) money, fringe benefits and promotions; (2) support from one's supervisor; and (3) acceptance or support from one's work group. However, there are innumerable second-level outcomes, as well as the possibility of third- and fourth-level outcomes (Connolly, 1976). Graen (1969) refers to second-level outcomes as "role outcomes."

The valence toward an outcome refers to the anticipated (as opposed to actual) satisfaction resulting from the outcome (Mitchell

and Biglan, 1971), and can be positive or negative. Expectancy refers to the degree to which the individual perceives that effort will lead to first-level outcomes or fulfillment of work role, such as receiving an improved rating on some measurement system variable (Anderson, 1981). Thus, it is an action-outcome relationship involving perceived probability. Instrumentality refers to the degree to which the individual perceives that first-level outcomes will lead to second-level or role outcomes. It is an outcome-outcome relationship, and involves perceived correlations.

Expectancy theory predicts that motivation, or the probability that a person will exert effort toward performing an act in order to achieve some first-level outcome or work role, is a multiplicative function of that person's valence toward the first level outcome times the expectancy that his/her effort or action will lead to the successful attainment of that outcome or work role. The valence for the first-level outcome is determined by summing the products of the individual's valence toward such relevant second-level outcomes times the perceived instrumentality that the first-level outcome will lead to each second-level outcome.

The second-level or role outcomes desired by individual workers can be termed 'rewards' (Nadler and Lawler, 1977). Rewards can be categorized as either extrinsic or intrinsic. Extrinsic rewards are external to the job itself and are organizationally controlled. Examples include pay, promotion, fringe benefits, job tenure, awards, certificates, praise from the boss, improved working facilities,

job security, and status symbols. Intrinsic rewards are related to doing the work itself, and are internally-based. Examples include a sense of accomplishment, feelings of responsibility and self-worth, and enjoyment of work itself.

Again, organizational buying behavior is work behavior. As such, it is motivated by the pursuit of various intrinsic and extrinsic rewards. From an expectancy theory standpoint, behavior in the buying center can be explained in terms of first-level outcomes (measurement systems or work roles) and second-level outcomes (rewards) facing each of the members. The degree to which each buying center member advocates a certain set of attributes, or a certain information source, product alternative, or vendor choice depends heavily on how he/she is evaluated in terms of some "work role," and what behaviors he/she perceives as instrumental in achieving certain rewards. The relevant question then becomes the source of that measurement system and those rewards.

The important rewards for any particular individual should be a function of reference group influences (Mortimer and Lorence, 1979). People typically find themselves operating at different levels in a given social environment. Thus, they belong to primary and secondary groups, and generally adhere more to the norms of the primary than the secondary group (Hare, 1976, p. 50). Reference groups represent bases the individual uses to evaluate his/her opinions, beliefs, and behavior. A primary reference group is one with whom the individual is in close personal interaction, such

as a group of peers or a closely knit work group (Homans, 1950). A secondary group exists in a more impersonal social context in which the individual interacts on a less frequent or less continuous basis. Reference groups serve to educate members concerning the values, norms, and required behavior patterns adhered to by the group, and to obtain compliance with group expectations in these areas. This compliance is dependent upon the group's ability to allocate those rewards of high positive valence to the individual, as well as the group's overall attractiveness to the individual.

Strong evidence exists concerning the ability of an individual's reference group and primary membership group to influence his/her attitudes and behaviors (Siegel and Siegel, 1957; Converse and Campbell, 1968; Doise, 1978; Hare, 1976). Engel, Blackwell, and Kollat (1978) cite considerable evidence of group influence on consumer purchase decisions. To the degree that the work unit has even greater saliency as a point of reference to the individual when the decision concerns an organizational purchase, its influence may be greater on his/her behavior in the buying center.

Within the organizational buying process, it would seem that a person encounters a number of potential reference groups, including his/her department, other departments, the buying center, and various informal groups. The relative influence of each should be a function of which controls the rewards which have greater valence for that individual. This, then, will determine which is the primary reference group. Given that an individual is measured and rewarded in

terms of his/her current position, the position taken here is that the individual is more functionally dependent upon the department than any of these other groups. When an individual is interdependent with a number of groups, as in organizational buying, the individual's actions should be in the direction desired by that group with which interdependence is highest (Cain, 1968). That is, it may be possible that an individual has reference groups in the organization other than his/her primary work group (department), but the work-role or first-level outcome which is instrumental for achieving second-level rewards is usually contained within a person's primary work group or functional department (Corey, 1978).

The buying center itself is both an informal and an ad hoc group. While some of these groups are fairly permanent, most usually come together for one or a few purchase decisions over time. Thus, any given buying group composition remains unaltered through one or a relatively few purchase decisions. Consequently, the buying center might be termed a 'secondary group' for any of its members.

As a result, members of the buying center bring to it their respective department's view of reality. Purchasing professionals, engineers, marketers, and others, see the buying process (e.g., emphasize different attributes) in terms of the norms, objectives, and expectations reflected in the rewards and measurement systems found in their respective departments. In Merton's (1957) classification, purchasing (or engineering or production) can be termed a normative reference group for department members, in that they

set and maintain standards which may be internalized by their members. Lawler (1976) concludes that people generally let the measurement system they face guide behavior. Corey (1978, p. 103) explains that "Managers in purchasing and in other functions, as well, will naturally behave in a way that maximizes their records of achievement in accordance with the ways they are measured." As people spend more time in the organization setting, a socialization process takes place wherein work experiences engender the adoption of certain occupational values over time. An individual's reward and measurement system serves to reflect and reinforce those values, leading to their adoption. Further, the reward and measurement system becomes one of those values (Mortimer and Lorence, 1979).

It has been emphasized that those in the buying center are dependent upon one another to fulfill organizational buying needs and objectives. Engineers provide vital performance and specification inputs. Finance personnel and accountants provide inputs concerning cash flow, transfer pricing, inventory policies, make-or-buy (or lease) decisions, cost analyses, and so forth. Marketers provide input regarding the likely impact of costs on pricing and consumer response to components or materials used in the company's product(s). Production personnel provide inputs regarding the implications of various purchase decisions for plant efficiency as well as make-or-buy decisions. The legal staff analyzes the implications of contractual agreements, and monitors conflicts of interest, vendor competition, price discrimination, regulatory restrictions on any

materials, and so forth. Given this, the ability of any one individual to obtain departmentally-based rewards may be affected by their interactions with others in the buying center.

While the members of the buying center face the separate reward systems of their departments, they may be dependent upon one another for successful attainment of those rewards. The purchasing-related actions by one member of the buying center not only impact upon the rewards received by that person, but also affect the evaluation and rewards received by other members. For example, while purchasing may be rewarded for saving the firm money, its ability to do so may be severely limited by the manner in which engineers set technical product specifications. Similarly, production personnel may be rewarded for meeting certain production quotas, and this may be adversely affected because the purchasing department saved money by using a less than dependable source of supply. Corey (1978) explains that purchasing department representatives are not only evaluated in terms of departmental norms, but also in terms of meeting the quality and delivery needs of user departments and negotiating acceptable prices.

The buying center can be characterized, then, as involving both task interdependence and goal interdependence. The departmental reward systems are also going to be instrumental in determining the degree to which buying center members adopt a cooperative or a competitive orientation in buying center decision processes. Before elaborating on the implications of reward-induced cooperation

and/or competition for the buying center, it is necessary to elaborate on the relationship between the reward system and conflict.

2.3.4 Conflict and the Buying Center

The objectives of the functional departments represented in the buying center may conflict in a number of ways. Purchasing may be concerned about maintaining certain vendor relationships, while engineering may want tolerances so precise or a special design that the purchasing-preferred vendor cannot meet or which conflict with the cost objectives of finance/accounting personnel. The legal department may want more competition in bid selection, while top management and marketing may emphasize some specific alternative source due to reciprocity relationships. Production may want to make the product rather than buy it. Sykes and Bates (1962) have described results of case study research where individuals in a given department develop group interests, loyalties, and values which underlie the development of interdepartmental conflict (see also Blake and Mouton, 1961). This conflict may be rooted in the reward and measurement systems of the various functional areas. Sheth (1973) indicates that conflicting motives and expectations are a common consequence of the purchasing decision process due to company policy of rewarding specialized skills and viewpoints.

Figure 2.1 is an attempt to conceptualize a number of the functional departments possibly involved in the buying center. It should be kept in mind that their respective involvements and influence vary from decision to decision as well as over the stages of a given

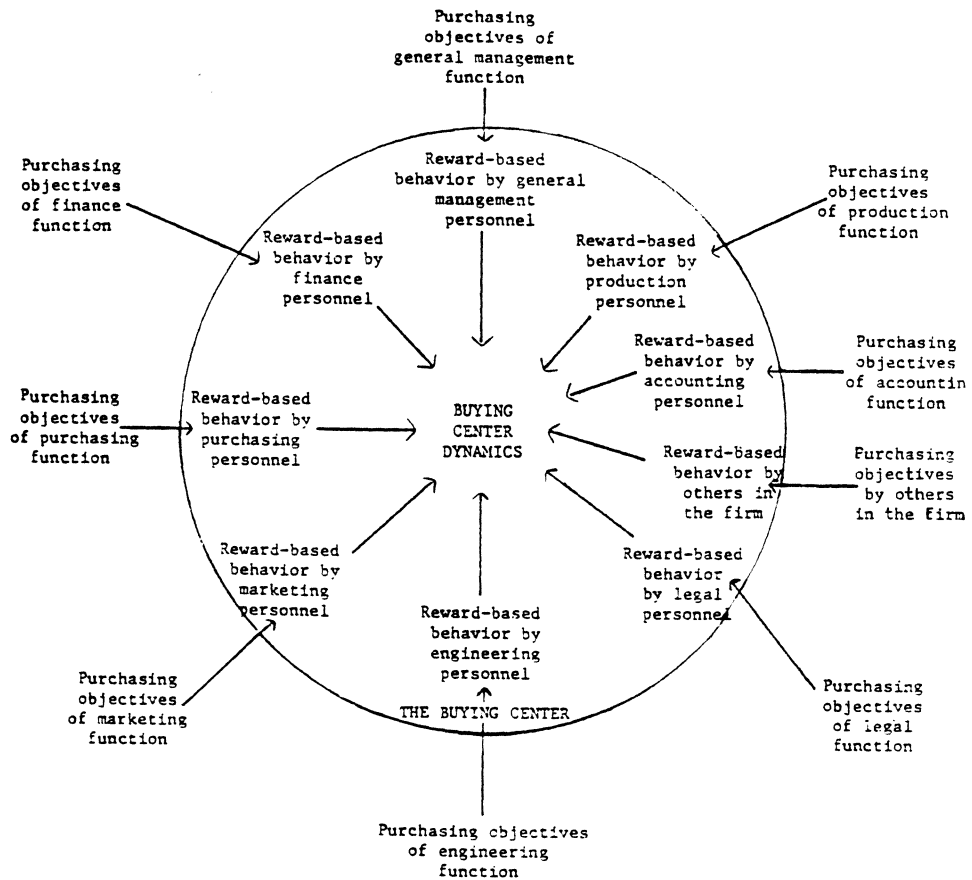


Figure 2.1: A Diagram of Functional Area Inputs into Organizational Purchasing Processes

decision process. This diagram illustrates that departments have purchasing-related objectives which they incorporate into their reward and measurement systems. The dynamics of the buying center arise, at least in part, from the behavioral responses of functional area representatives to these rewards and measures.

A theoretical basis for the differing, and sometimes incompatible orientations of functional areas can be found in Lawrence and Lorsch (1967). They discuss conflict between departments in a firm in terms of various sub-components of the firm's external environment. Organizations are viewed as consisting of a sales subsystem, a production subsystem, and a research and development subsystem. The firm's external environment consists of a market subenvironment, a technical-economic subenvironment, and a scientific subenvironment. Thus, organizations differentiate themselves into subsystems to deal with the demands of environmental subcomponents. Yet they need to integrate internal subsystems to successfully accomplish the organizational task. Lawrence and Lorsch find that members of a given subsystem will develop a goal orientation which is primarily concerned with coping with the demands of the related subenvironment. Separately, Corwin (1969) demonstrates that conflict increases with the degree of differentiation in an organization, and is greatest when there is task-interdependency and a need for joint decision-making.

In pursuing the implications of interfunctional conflict for buying behavior, the issue of organizational conflict (as opposed

to internal psychological conflict or role conflict) warrants more detail. Most of the research on conflict has been concerned with "the degree of concordance of goals between persons and the scarcity of resources that fosters competition between them" (Tedeschi and Linkskold, 1976, p. 292). Thomas (1976, p. 890) defines conflict between social units (individuals, groups, organizations) as "a process which includes the perceptions, emotions, behaviors, and outcomes of the two parties...and which begins when one party perceives that the other has frustrated, or is about to frustrate, some concern of his." Walton, Dutton, and Cafferty (1969, p. 526) are more specific in explaining that:

"Relationships between departments in a formal organization can be characterized by the amount of responsiveness of a department to the needs of another department, the accuracy of information exchange, and the attitudes of department members toward the other department or its members. Inter-departmental conflict means there is interference rather than considerateness, information is distorted or withheld, and attitudes of annoyance and distrust exist between departments."

A distinction can be drawn between 'frictional' conflict, which is unintended and arises from problems in the quality of coordination provided by the formal and informal organization structure, and 'strategic' conflict, which is deliberately created by members of the organization in order to force a change in the allocation of resources, authority, and functional responsibility (i.e., a change in structural relationships) (Pondy, 1969, p. 501). Frictional conflict arises when departmental representatives perceive ambiguity in jurisdictional boundaries, conflict of interest between departments,

physical barriers to communication, and when they feel more dependent upon other departments (i.e., interdependence is asymmetrical) (Walton, Dutton, Cafferty, 1969). The work of Strauss (1962) on purchasing agents provides support for the idea that a group which is symmetrically highly dependent on another may perceive such circumstances as conflictful, and behave so as to enhance its own influence. Thus, frictional conflict may exist in the buying center due to formal and informal structural relationships, and certain behavioral responses, such as coalition formation, represent strategic conflict.

Stated differently, certain antecedents to interunit conflict can be identified, and these will result in the behavioral dynamics of conflict. To determine whether the consequences of these dynamics are functional or dysfunctional, one has to analyze the effect both on specific parties and on the overall performance of the task in question. In addition to those cited above, Walton and Dutton (1969) discuss a number of antecedents to conflict which also have relevance for this research. These include differences in the way departments are ranked in terms of such organizational status dimensions as prestige and power, the direction of initiation of action, inconsistencies between knowledge distribution among departments and influence patterns among departments, the relative degree of uncertainty in the environments of the various departments, role dissatisfaction, and a dependence on common resources between departments. Moreover, they stress the importance of the reward and measurement

system.

When each of the interdependent departments is measured/rewarded based on only one side of some dilemma integral to the organizational task, conflict is likely (Walton and Dutton, 1969, p. 75). They indicate (1969, p. 75) "...the more the evaluations and rewards of higher management emphasize the separate performance of each department rather than their combined performance, the more conflict." Conflict is also more likely when the measurement system is not adequate at assigning credit or blame or assessing relative contributions between two departments, and when measurement is based on ambiguous criteria (Kerr, 1975). Although conflict may be inherent in the design of some task, the reward system designed by management can serve to sharpen or to blunt the divisive effect of task incongruities (Walton and Dutton, 1969).

Litterer (1966) discusses the likelihood of different sources of conflict to result in functional versus dysfunctional outcomes. Conflict tends to be destructive when it results in a lack of recognition of mutual objectives on the part of the parties (Assael, 1969). Alternatively, so long as there is some commonality of goals, competition and conflict within a group "intensifies the search for and analysis of decision alternatives and improves the overall quality of decisions" (Pondy, 1969, p. 503). Litterer (1966) indicates that incompatible goals represent a much more troublesome source of conflict than incompatible means, in that alternative means may be available for accomplishing a task, while

goals can be quite difficult to change (see also Sheth, 1973). These goals are typically reflected in organizational reward systems.

Kerr (1975) provides numerous examples of reward systems which create inconsistencies between unit or group performance and individual achievement of rewards. He refers to the "folly of rewarding A while hoping for B." Under such circumstances, it becomes rational for individuals to think of themselves first and the group or organization second. In an industrial buying context, an organization may be hoping that its members collaborate in such a manner as to produce buying decisions which best serve organizational needs. However, they may be rewarding a competitive orientation among members of the buying center, where departmental or individual interests are emphasized first and foremost. The by-product of such reward systems is likely to be conflict. Deutsch (1949) provides support for the contention that reward-induced competition is a major source of interpersonal conflict.

In summary, structural differentiation of an organization into functionally interdependent subunits which are administratively independent is fundamental to organizational survival, given the complexity and instability found in the environments facing most modern corporations. Yet, this differentiation often results in conflict in lateral relationships when subunits are engaged in joint decision-making. This conflict is due to differences in values and objectives, which are frequently incorporated into reward and measurement systems. The nature of the reward systems faced

by individuals will determine whether they take a competitive or cooperative approach toward resolving such differences, and establish mutual objectives. The remaining question concerns the implications of cooperation and competition for the behavioral dynamics within the buying center, and specifically, coalition formation.

2.3.5 Support for a Relationship Between Rewards and Coalitions in the Buying Center

The literature on organizational buying behavior has devoted scant attention to the role of rewards in the buying center, although they have been mentioned as a major influence on the buying process. In their descriptive model of organizational buying behavior, Webster and Wind (1972) explain that the behavior of individual members of the buying center is often best explained by their perceptions of reward criteria and the distribution of rewards. In their model, they group rewards with a number of other organizational influences on the buying process, however, and say little about the specific implications of different types of reward systems. Sheth (1973), in his model of the process, incorporates rewards as a major source of buying center conflict. Given the difficulties in changing the goals designed into reward systems, he argues that this type of conflict is likely to be resolved in nonrational ways, such as bargaining or politicking. Sheth does not expand any further, however, on the nature of the relationship between rewards and buying behavior.

Wind (1971) has presented a reward-balance model to explain

the buying behavior of purchasing agents. This model is based on the notion that "an organizational member's status, authority, and communication position can, in fact, be defined on the basis of his position in the reward system" (p. 207). How other members of the organization can influence a purchasing agent's rewards affects his or her behavior toward them. Wind discusses two types of rewards: formal organizational rewards (largely from the purchasing manager), and social rewards (from inter-relationships with others in the organization). The buyer strives toward some homeostatic balance between his or her own reward needs and the ability of the purchasing manager and others (e.g., users) separately to fulfill such needs. While this perspective sheds some light on the nature of interpersonal relationships in the buying center, it is oriented solely toward the purchasing agent. Moreover, it provides little direction in explaining group dynamics in the buying center.

Anderson (1981) is in the process of developing a model in which the reward and measurement system is the underlying dynamic of the entire buying process. Arguing that industrial buying research consists of a series of relationship studies which are not integrated in any fashion, Anderson notes the lack of any consensus among industrial marketers concerning a research paradigm in the field. Wind and Thomas (1980) have also voiced concern for the lack of overall direction in industrial buying research efforts. Thus, Anderson is suggesting that an integrative paradigm be built

around the realization that organizational purchasing is work activity, and, as such, can be explained fundamentally in terms of rewards sought by organizational employees and measurement of their performance.

Similarly, coalition formation has been emphasized as important, but even less attention has been devoted to explaining its causes or implications. In fact, there has been no empirical work to date on coalitions in the buying center, and little theoretical work. The likelihood of coalitions has been stressed by a number of researchers (Strauss, 1962; Rubin and Brown, 1975; Bagozzi, 1978; Corey, 1978), and some have gone so far as to argue that most buying decisions are actually made by coalitions (Bonoma and Zaltman, 1978, p. 13). Bagozzi (1978, p. 117) notes that coalition activity has been largely ignored by researchers as a phenomenon in the buying center, and urges a change in this state of affairs.

In fact, behavioral strategies within the buying center have been generally ignored. In his model of organizational buying, Sheth (1973) enumerates four types of conflict resolution mechanisms which come into play in the buying center. These include problem-solving, persuasion, bargaining, and politicking. He does not elaborate, though, on the actual behavioral strategies which are used in implementing these mechanisms. Choffray and Lilien (1978) discuss different possible patterns of interaction among buying center participants, and suggest that researchers attempt to simulate the impact of different interaction assumptions on overall

group response to some marketing strategy.

The same reward system that gives rise to conflict and conflict resolution mechanisms may also encourage coalition formation as a behavioral strategy. This is especially the case when marked power or influence differences exist among departments (Corey, 1978). Anderson (1981) suggests that coalition formation might be an important strategy among individuals subject to widely disparate reward systems when attempting to form some consensus. He concludes that little is presently known concerning the relative incidence of coalitions or the antecedent conditions leading to coalition formation in the buying center.

Where a group must complete a task in which members are interdependent, it has been demonstrated in preceding sections that both group process and productivity are affected differently by reward systems encouraging cooperation versus competition (Deutsch, 1949; Miller and Hamblin, 1963; Scott and Cherrington, 1974; Okun and DiVesta, 1975; Rosenbaum, et al., 1980). Similarly, group dynamics within the buying center should be affected by the cooperative or competitive orientation of departmental reward systems. It has also been demonstrated that coalition formation is a strategy encompassing both cooperative and competitive elements and that the decision to coalesce is strongly influenced by the reward system (Lawler and Youngs, 1975; Folkes and Weiner, 1977; Hinckley, 1979; Komorita and Tumonis, 1980; Komorita, Sweeney, and Kravitz, 1980; Miller, 1980; Kravitz, 1981). Similarly, the departmental reward

system one brings to the buying center is likely to influence the decision to coalesce with representatives of other departments (Anderson, 1981). As a result of structural differentiation within organizations, the reward systems of various departments may emphasize incongruous objectives in buying decisions. At issue is the degree to which these reward systems encourage a competitive versus cooperative orientation toward resolving conflicting departmental concerns, and thus the degree to which they encourage coalitions. That is, work settings emphasizing cooperation can be expected to have quite a different effect on coalition formation compared to those encouraging competition (Folkes and Weiner, 1977; Komorita, Sweeney, and Kravitz, 1980).

The presence of conflicting goals among functional areas effectively turns the purchasing process into an integral political process (Corey, 1978, p. 129). The individual entering the buying center is confronted with a mixed-motive bargaining situation, where an orientation involving both cooperative and competitive elements may be required. While conflicting objectives between departments may engender a competitive strategy for a given departmental representative, the task interdependencies may engender a cooperative strategy. The various individuals involved are motivated by self-interest in coping with the separate reward systems of the purchasing, engineering, or production departments (among others), and a purely competitive or purely cooperative orientation may not be in one's own self-interest. One possible strategy would

be to cooperate with some (form coalition), and to compete with others. The key to understanding individual behavior within the buying center may be the relative emphasis on cooperation versus competition built into reward systems. The concern of this dissertation is to determine what role the reward system plays in affecting the nature and the extent of such coalition formation.

2.4 MODEL, HYPOTHESES, AND ASSUMPTIONS

2.4.1 The Conceptual Model

Given that organizational buying operations represent work behavior, the formal reward and measurement system would appear to be a major variable in explaining buyer behavior. At the same time, the buying center construct has been developed on the assumption that most purchase decisions involve a group process. Individuals entering the group bring to it their departmental reward and measurement systems, which incorporate the values and objectives that individual has been socialized to accept. Where these reward systems encourage cooperation, one would expect a different group process than under a reward and measurement system encouraging competition. While individuals in the buying center are, by definition, task interdependent, they may have incompatible task objectives as a function of how they are rewarded and measured. The resultant conflict may encourage coalition formation as a means to favor one vendor over others. Payoffs here are not provided directly to the various coalitions, but instead to the individuals through their departments. In a real sense, the department

represents a reference group.

These relationships are demonstrated in Figure 2.2, below, which is the conceptual model to be tested in this dissertation. As can be seen, perceived conflict and coalition formation are correlated by-products of the various reward systems. The dependent variables, then, are both perceived conflict and coalition formation, while different reward systems represent the independent variables. Rewards are varied through the inclusion of three types of formal reward systems. Each should result in a different level of perceived conflict and coalition formation in the buying center. Coalitions, then, are a logical behavioral response to the reward system. Conflict is a group level variable, represented by the aggregated perceptions of those in the buying center. Thus, conflict and coalitions are not conceptualized as departmental phenomena, but rather as buying center phenomena, for this is the group of interest. The dotted line between conflict and coalitions is meant to represent a link which is only a secondary concern in this research. Moreover, the design described in the following sections provides for measurements of conflict and coalition formation at the same time, making it inappropriate to include a causal link. However, it is expected that they will be correlated.

The three types of reward systems to be included are cooperative, competitive, and independent (mixed). These are the ones cited in the literature as most responsible for group outcomes, with most of the empirical efforts concentrating on the first two.

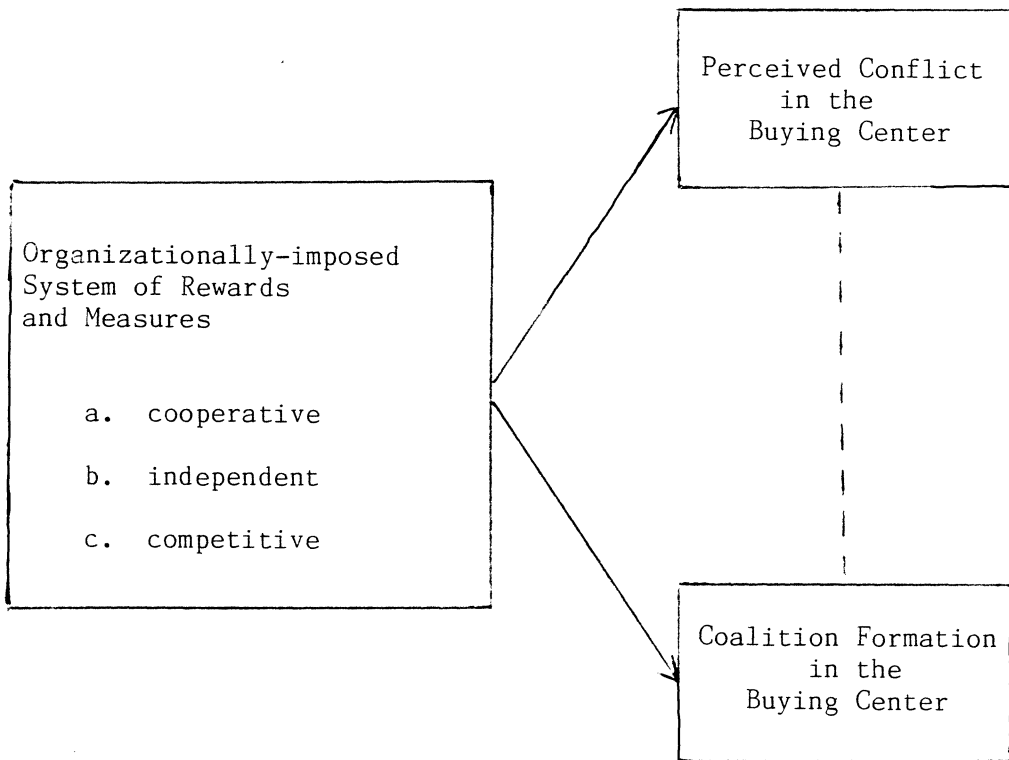


Figure 2.2 Conceptual Model of the Linkages
Between Rewards, Conflict and Coalitional
Behavior in a Buying Center Group

A cooperative reward system gives all group members an equal share of the reward, but varies the size of the reward as a positive function of group productivity. A competitive reward involves a zero-sum, winner-take-all scenario, in which one group member outperforms the rest and takes the entire reward. An independent reward system gives each actor a reward based solely on his/her contribution to the group effort. These three are what might be termed "pure" reward systems, and so the cooperative and competitive systems represent end-points on a continuum with a mid-point represented by the independent system.

The buying center has been presented as a mixed-motive bargaining situation. The conflicting objectives between departments may give rise to a competitive strategy on the part of individuals, while the task interdependencies may engender a cooperative strategy. It is the reward system faced by that individual which should determine his/her strategy. Self-interest may dictate a more cooperative or more competitive orientation dependent upon that reward system. Coalitions represent a vivid example of mixed-motive bargaining, where members cooperate with one another so as to enhance their competitive positions vis-a-vis other individuals and coalitions in the buying center.

Perceived conflict arises because of individual behavior motivated by divergent reward systems. The magnitude of this conflict should increase as one moves from a purely cooperative reward system to an independent system, and from an independent system to a purely

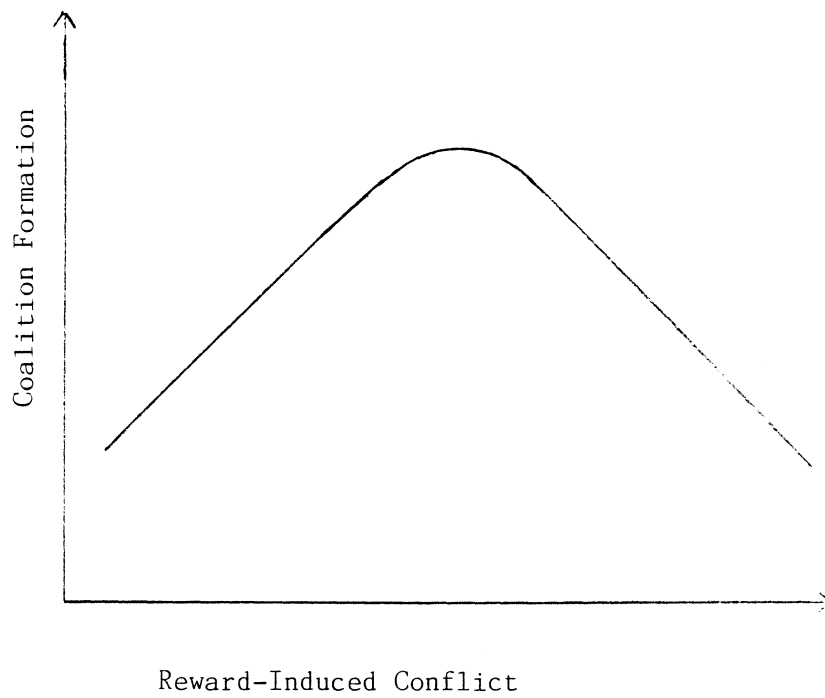


Figure 2.3 A Diagram of the General Relationship Hypothesized to Exist Between Perceived Conflict and Coalition Formation in the Buying Center

competitive system. At the same time, coalitions should be most likely in situations involving moderate levels of conflict, as opposed to low or high levels, as diagrammed in Figure 2.3. For simplicity, the coalitional response to increasing levels of conflict is pictured as a continuous curvilinear function, although the intent is merely to suggest the overall direction of the general relationship. These relationships are discussed in more specific detail in the following set of hypotheses which are generated from the conceptual model.

2.4.2 Hypothesized Relationships

While departmental objectives relative to the organizational purchasing function may conflict, the department system of rewards and measures may encourage different behaviors ranging from highly cooperative to highly competitive depending on the power and structural realities of the organization. Thus, if engineering is a dominant area in the firm as a function of the power and resources it controls, then the departmental reward system may encourage a competitive approach to achieving departmental objectives. The following six hypotheses provide an indication of what should happen when various departmental representatives meet in the buying center.

- H_{1a}: A cooperative reward system will result in low levels of perceived conflict in the buying center relative to independent or competitive reward systems.
- H_{1b}: A cooperative reward system will result in low levels of coalition formation in the buying center relative to that found under situations involving an independent reward system, and approximately equal to that found under a competitive reward system.

A truly cooperative reward system is one that effectively bridges the void between self-interest and collective action. The individual's welfare is enhanced only as a function of the group product. Extensive evidence exists demonstrating a strong relationship between a cooperative orientation and group productivity, as discussed earlier. In reviewing numerous studies on this topic, Hare (1976) summarizes that, "In general, group members who have been motivated to cooperate show more positive responses to each other, are more favorable in their perceptions, are more involved in the task, and have greater satisfaction with the task." Conflict can arise over disagreements regarding both group goals and the means to those goals. A purely cooperative reward minimizes conflicts over ends and encourages compromise and coordination over means, for each person's "best" outcome is a function of every other person's "best" outcome (Tedeschi and Lindskold, 1976). As a result, perceived conflict should be relatively low where people are rewarded for cooperating.

Coalitions are temporary alliances built around differences of opinion regarding the means to a group goal. They "typically form and maintain themselves because of some social conflict within the larger system," and thus are based on realistic and substantive conflict (Fisher, 1980, p. 243). Gamson (1961) indicates that coalitions arise most often in situations where individual objectives differ and little value consensus is present. Mazur (1968) stresses that coalitions form based on relations of conflict and support

rather than like or dislike. Moreover, the entire body of coalition-al literature reviewed earlier assumed the existence of some conflict underlying the motivation to coalesce. Differing payoffs to various coalitions and differing resource-power positions were the primary determinants of coalition formation. Both imply the presence of conflict in a group. One would expect the cooperative reward to result in what Rapoport and Kahan (1976) term a "grand coalition." It should be stressed, however, that the low conflict and limited number of coalitions in the buying center under a cooperative reward situation may be somewhat offset by the presence of a strong departmental preference for a specific vendor. That is, some conflict may arise where a departmental reward system encourages cooperation, while members know that their department favors a certain vendor's attributes. A corresponding moderate increase in coalition formation might be expected.

H_{2a}: A competitive reward system will result in high levels of perceived conflict in the buying center relative to cooperative or independent systems.

H_{2b}: A competitive reward situation will result in low levels of coalition formation in the buying center relative to that found under an independent reward system, and approximately equal with that found under a cooperative reward system.

Differentiation of organizations into departments creates more potential for conflict, but not necessarily more manifest conflict (Walton and Dutton, 1969). When these departments or functional areas perform differing tasks, and deal with differing components of the environment, they tend to develop major internal differences

and orientations (Lawrence and Lorsch, 1967). Where a task such as buying involves interdependency among functional areas, goal competition is likely to result. Further, purchases represent scarce resources to all but the most affluent firms, and they often impact upon the subsequent performance of any number of functional areas in the firm. Thus, the buying decision demonstrates at least three of the antecedents to interdepartmental conflict described by Walton and Dutton (1969): mutual task dependence, competing objectives among differentiated functional areas, and a dependence on common resources.

A purely competitive reward system creates a zero-sum scenario where an individual is rewarded at the expense of all the others in the group. It is a true emphasis on individual performance, and, as such, is an example of how performance criteria and rewards can serve to heighten conflict. That is, conflict is intensified separate from but in addition to the existing dilemmas or conflict antecedents contained in the task. Blake, Shephard, and Mouton (1964) explain that intergroup disagreement under win-lose conditions gives rise to such intense human emotions that an impasse is likely, and that mechanisms such as arbitration by a neutral outside party should be utilized to shorten the period of such intense conflict. Separately, Blake and Mouton (1961, p. 310) stress that "under competitive conditions members of one group perceive that they understand the other's proposal when in fact they do not. Groups tend to act toward one another's solutions as though they had blinders on."

Tedeschi and Lindskold (1976) suggest that the intensity of conflict is a major determinant of the tactics individuals use to influence one another. They indicate (p. 373), "Intense conflict breeds suspicion and reduces the effectiveness of more peaceful modes of influence, such as promises, persuasion, or the activation of commitments." Moreover, intense conflict appears to diminish one's apparent power base. (Note: Bonoma (1982) has recently provided an analysis of bases of power in the buying center.) If one normally has influence resulting from expert, legitimate, or referent power, such bases may be ignored in the presence of intense conflict (see Raven and Kruglanski, 1970; Tedeschi and Lindskold, 1976). Further, reward power becomes suspect because it is viewed by others as a bribe or as a means to maintain superiority. Individuals may anticipate the ineffectiveness of each of these power bases, or will find this to be the case when trying to use them. Correspondingly, coercive power is legitimized, and parties may attribute coercive motives to one another, heightening the conflict.

In a purely competitive setting, one has merely to attempt to achieve one's goal in order to prevent another buying center member from achieving his/her goal. The extensive conflict under a purely competitive arrangement does not allow for individuals to develop common interests. The exception might only be to keep someone else from winning. Rosenbaum, et al (1980) present evidence that the deleterious effects of intense competition in task-interdependent situations lead to individual behaviors such as the blocking

and sabotaging of others' efforts.

As a result, coalition formation would seem unlikely in a high conflict situation. Coalition formation is a strategy used by individuals negotiating over some mutual conflict intended to increase their power in bargaining, so as to resolve the conflict of interest. One has no motivation to compromise, for he/she would effectively be forfeiting any reward. The lack of any willingness to cooperate and compromise so as to uncover common interests is likely to result in a deadlock or impasse in the decision-making process.

H_{3a}: An independent reward system will result in a moderate level of perceived conflict in the buying center relative to cooperative and competitive systems.

H_{3b}: An independent reward situation will result in extensive coalition formation relative to that found under either cooperative or competitive reward systems.

The independent condition can be considered an intermediate reward condition, according to Rosenbaum, et al (1980). While it has not been examined very extensively in the group context, the independent reward represents an important mid-point between the cooperative and competitive extremes. As a mixture of both, it places the individual in a "social dilemma" (Dawes, 1980), where rewards from cooperation come at the expense of competitive rewards. Thomas (1976) explains that a mixed-motive scenario does not encourage either cooperation or competition, but rather allows either. The individual is not directly rewarded for the group product, as in the cooperative situation, but rather is rewarded differentially for his/her own efforts. The group becomes, in effect, a medium

for self-reward (Rosenbaum, et al., 1980). While outcomes are not zero-sum, relationships are somewhat ambivalent. That is, the members of the group find that "their interests are partly coincident and partly in conflict" (Tedeschi and Lindskold, 1976, p. 294). Similarly, Folkes and Weiner (1977) have empirically demonstrated that an intermediate level of interpersonal conflict exists in mixed-motive conditions.

Coalition formation is a mixed-motive bargaining strategy, in that a subject is cooperating with some so as to enhance his/her competitive position in terms of others. An individual decides to join a coalition based on his/her perception of both the payoff to that coalition relative to alternative payoffs, and the probability of that coalition winning. The individual views the benefits of cooperation and compromise with specific others as greater than the costs involved in compromise and cooperation with the entire group or the risks involved in going it alone. Compromise involves giving up some parts of one's position in order to maintain other parts. As such, it involves elements of both cooperation and noncooperation. Thomas (1976, p. 922) argues that such compromise is less likely in a very cooperative climate or a very conflictful climate. He indicates (1976, p. 922) that individuals perceiving intermediate levels of conflict are the most likely to be behaviorally oriented toward such compromise rather than investing the time and effort required in more assertive, risky behaviors. Gruder (1970) presents a similar argument regarding cooperation and

coalitions.

While it is widely recognized that conflict is not necessarily dysfunctional from an organizational standpoint, it appears that this is true within some moderate range of conflict (Walton and Coser, 1956; Assael, 1969; Pondy, 1969; Walton, Dutton and Cafferty, 1969; Walton and Dutton, 1969). Assael (1969) argues that the possibility of a balance of power is a prerequisite for conflict to induce constructive outcomes. Coalitions are a means to establish and maintain such a balance of power.

In summary, the hypotheses to be tested will involve linking group reward systems to the level of perceived conflict in the group, and such reward systems to the level of coalition formation in the group. These relationships are summarized in Figure 2.4, below.

<u>REWARD</u>	<u>PERCEIVED CONFLICT</u>	<u>COALITIONS</u>
Cooperative	low	low
Independent	medium	high
Competitive	high	low

Figure 2.4 Summary of Hypothesized Relationships
Between Rewards and Both Conflict and Coalitions

2.4.3 Assumptions

Underlying this research are a number of assumptions that warrant specification. For example, it is assumed that buying behavior

is an activity which can be studied independently of selling behavior. While salesmen might actually be part of the buying center, they are left out of this analysis. However, their behavior is also explainable in terms of a reward and measurement system based in their own firm. Additionally, a fundamental assumption of a reward-based research tradition is that subjects act in a manner which is not rational in a pure economic sense, but is consistent with expectancy theory. They do not maximize utility, possess perfect information (such as that concerning the utility functions of other players), or process information perfectly. Rather, individual behaviors and characteristics such as spite, altruism, physical attractiveness, and perceived similarities among actors are potential behavioral influences, especially in groups, but are hopefully limited via random assignment. It is assumed that people join organizations in order to obtain outcomes related to personal objectives. Further, it is assumed that people in groups are more concerned with self-interest than group interests, and will behave accordingly unless specific incentives exist which make the group a medium for achieving self-interest.

The remaining assumptions apply to the buying center itself. As discussed earlier, decisions typically are not hierarchically imposed on a buying group. This experiment will be conducted under such an assumption. The research will take the group as the appropriate unit of analysis, thus assuming that buying behavior is a group behavior, not an individual behavior. Further, actors entering

the buying center are assumed to be departmental representatives, or boundary role persons in Adam's (1976) terms. Thus, the buying center will be characterized as a collection of departmental representatives. Departments themselves are thought to stress specific vendor evaluation criteria reflective of departmental objectives. Members are in turn socialized to value those criteria, and the reward system is reflective of them. For purposes of analysis, these departments will be attributed mutually conflicting objectives. Conflict is a buying center phenomenon which has not been adequately dealt with. A better understanding of its implications will be realized by allowing extensive amounts, and then later relaxing this assumption. Finally, the departments in a firm generally vary in their overall influence within the organization. For example, industrial manufacturers often demonstrate more of a production or technological orientation than a customer orientation, as a function of stronger resource-power positions by engineering personnel. This study will assume equal resource-power positions among departments.

Chapter 3

RESEARCH METHODS

3.1 PRETEST

The experiment which was designed to test the model and hypotheses was pretested using 140 undergraduate students at the College of William and Mary, Old Dominion University, and Radford University. The pretest was used to identify the problems in the procedure, to determine if the manipulations were properly constructed, and to make an initial evaluation of the impact of the experimental manipulations.

The procedure itself initially took over three hours to complete. Adjustments were made to streamline the process into a little over two hours. Other changes were made to clarify ambiguous aspects of the procedure and the reward systems. These revisions are discussed as they are relevant in the following sections. The manipulations of reward systems in the pretest appeared to have the expected impact on both perceived conflict and coalition formation.

3.2 SAMPLE

Subjects included 105 students enrolled in undergraduate business courses taught by the researcher and others at Old Dominion University and the Virginia Polytechnic Institute and State University. The classes were selected on the basis of their accessibility for the length of time and number of meetings required in this experiment. They included 63 males and 42 females. As a part of these classes, the conduct and results of the experiment were explained to the students afterwards, thus serving as valuable pedagogical tools.

The use of students raises a number of issues, and represents both advantages and drawbacks for this research. It is felt that, in exploratory work of this sort, the advantages outweigh the disadvantages. The use of students in studies of consumer behavior is fairly extensive, as are criticisms of this practice (Enis, Cox and Stafford, 1972; Cunningham, Anderson, and Murphy, 1975; Ferber, 1977; Lamb and Stem, 1979). It appears that significant differences exist between students and the populations they are used to represent in terms of psychological states (e.g., attitudes, interests, beliefs, opinions). Very little conclusive evidence exists, however, challenging the validity of using student surrogates when one is interested in a psychological process rather than a state. Further, the empirical work in social psychology on groups as well as coalitions is predominantly reliant on student samples. This is, of course, largely experimental work.

The current study is also an experimental study of group behavior. Moreover, it is concerned with group processes, not individual states. The assumption that people seek rewards and behave accordingly, is not limited to members of a business organization. This study is also, as indicated above, exploratory in that such a social psychological group perspective has not guided empirical efforts in the area of industrial buying behavior. Moreover, this research can be termed a "theory based intervention" directed at application of a theory (Calder, Phillips, and Tybout, 1981). The use of students does not represent a major problem, in that efforts to falsify an intervention:

"only require that the research subject the intervention to levels of variability that it might encounter in the real world. The research need not mirror the real world because it is the theoretical relationships represented by the intervention, and not the particular effects observed in the research, that is applied (Calder, Phillips and Tybout, 1981, p. 203)."

Finally, it can be argued that use of actual representatives of the relevant populations is desirable, but not practical. To be legitimate, representatives would have to be generated for each organizational department of interest. That is, a sample of just purchasing agents, for example, would actually be less desirable than students. This is because purchasing agents are already socialized in terms of the purchasing department's values, norms, and rewards. To ask them to play a role of another department's representative to the buying center in a task which they themselves perform daily would, most likely, find them acting in accord with their normal role. At a minimum, they would be strongly biased in this direction. To generate enough representatives of real organizational departments so as to meet the requirements of statistical significance in a study using groups as the unit of analysis does not appear feasible.

3.3 EXPERIMENTAL DESIGN

This research is an attempt to establish some causal linkages among variables that have been largely ignored in the research on organizational buying. The need to isolate influences and exert the control necessary for causal inferences make laboratory experimentation especially attractive. Calder, Phillips and Tybout (1981) have presented a strong case for the acceptability of using laboratory

settings and student subjects when the research objective is theory application as opposed to effects application. Theory application is concerned with testing a theory so as to advance scientific knowledge, where the theory should be applicable in a wide range of real-world situations. Effects application research seeks to obtain findings which can be generalized for a particular situation, but which are not "linked by inference to theoretical constructs and the hypothesized theoretical network then used to deduce patterns of outcomes (Calder, Phillips and Tybout, 1981, p. 198)." This research falls within the realm of theory application, where the goal is to examine a scientific theory of the relationship between reward systems and coalition behavior and to design a theory-based intervention or program which is viable in the real world. Thus, the interest lies in being able to generalize this theoretical relationship rather than generalizing specific outcomes observed in an empirical test. Calder, Phillips and Tybout (1981, p. 203) conclude that "...this entails selected homogeneous respondent samples, tailoring multiple empirical operationalizations to the abstract theoretical concepts they are meant to represent, and conducting true experiments in laboratory or other settings that are relatively free of extraneous sources of variation."

The experiment conducted in this research utilizes what can be termed a "mixed" design. It represents a combination of the completely randomized between subjects design, where each subject is exposed to a single treatment, and a within subjects or repeated

measures design, where each subject is exposed to all of the treatments. In the repeated measures design, each subject's responses to a treatment are analyzed relative to that subject's responses to the other treatments. This provides for enhanced control over differences between subjects, and thus the ability to partition out that source of error variance.

There were three treatments, one each representing the competitive, cooperative, and independent reward systems. The unit of analysis is the buying center, and the members of each buying center participated in three purchasing decisions (repeated measures). However, different subjects were used to make up the buying centers in each treatment. As a result, the repeated measures are within each treatment, while each of the treatments was applied to a different group of subjects. The advantage of this mixed design is that it allows for analysis of any changes in subject behavior over trials within each treatment, as well as any differences in the behavior of various respondents under different treatment conditions. The reason for having repeated trials is based on the concern that enough opportunity be permitted for each treatment to have its "true" effect, or to reach some asymptotic level. The procedures used to manipulate the reward systems are sufficiently complex as to raise questions concerning the use of just one decision trial.

The specific design which represents the basis for analysis is found in Figure 3.1. This design is based on a fixed-effects model, in that the three treatment levels were not randomly selected

Competitive Treatment					Independent Treatment					Cooperative Treatment				
Dec 1		Dec 2	Dec 3	$\bar{X}$	Dec 1		Dec 2	Dec 3	$\bar{X}$	Dec 1		Dec 2	Dec 3	$\bar{X}$
BC 1	X_{111}	X_{121}	X_{131}	$\bar{X}_{11}$	BC 6	X_{112}	X_{122}	X_{132}	$\bar{X}_{12}$	BC 11	X_{113}	X_{123}	X_{133}	$\bar{X}_{13}$
BC 2	X_{211}	X_{221}	X_{231}	$\bar{X}_{21}$	BC 7	X_{212}	X_{222}	X_{232}	$\bar{X}_{22}$	BC 12	X_{213}	X_{223}	X_{233}	$\bar{X}_{23}$
BC 3	X_{311}	X_{321}	X_{331}	$\bar{X}_{31}$	BC 8	X_{312}	X_{322}	X_{332}	$\bar{X}_{32}$	BC 13	X_{313}	X_{323}	X_{333}	$\bar{X}_{33}$
BC 4	X_{411}	X_{421}	X_{431}	$\bar{X}_{41}$	BC 9	X_{412}	X_{422}	X_{432}	$\bar{X}_{42}$	BC 14	X_{413}	X_{423}	X_{433}	$\bar{X}_{43}$
BC 5	X_{511}	X_{521}	X_{531}	$\bar{X}_{51}$	BC 10	X_{512}	X_{522}	X_{532}	$\bar{X}_{52}$	BC 15	X_{513}	X_{523}	X_{533}	$\bar{X}_{53}$

KEY: BC = Buying Center

Dec = Decision Number

X_{ijk} = an observation (case), with i = buying center number (rows),
 j = decision number (columns), and k = treatment

$\bar{X}_{ik}$ = means across decisions for the i^{th} buying center and k^{th} treatment

Figure 3.1: Research Design for Analytical Purposes

from a population of levels. Rather, the treatment levels about which inferences are to be made are those included in the experiment, and those are the levels that would be used in any replication (Kirk, 1968, p. 127). As is illustrated in Figure 3.1, this research utilizes a 3x3 design, where each of the three treatments includes three decisions. Five buying centers are found in a treatment. Each X_{ijk} is an observation for coalition formation or perceived conflict found in the i th buying center for the j th decision with the k th treatment. Discussions of somewhat analogous designs can be found in Kirk (1971, p. 518) and in Winer (1971, p. 518).

3.4 PROCEDURE

Within each of the reward treatments, subjects were randomly assigned to one of seven groups, each consisting of five members. Each group represented a lateral department involved in the purchasing process. Functional areas represented included design and development engineering, maintenance, production, sales/marketing, purchasing, finance/accounting, and quality control. These were selected based on studies of buying center composition which demonstrated their frequent influential role (Weigand, 1968; Brand, 1972; McMillan, 1973; Patchen, 1974; Spekman and Stern, 1979). General management did not directly participate, so as to control for the influence of hierarchical decision-making in groups. Further, top management frequently is not involved in buying decisions (Corey, 1978; Faris, 1974). For simplicity, this research constructed purchase decision-making units (buying centers) as composites of departmental

representatives, where the departments of interest each had one representative per group.

Experimentation took place in part during regular class hours, as well as during specially arranged time periods outside of class. Subjects were told that they were participating in a study of the complexities of the industrial purchase decision process where multiple departments are involved. Such an instruction was sufficiently logical and in line with the actual task as to limit subject curiosity concerning any other possible purpose. Further, it adequately disguised the actual intent. Inclusion of rewards were explained as an attempt to make the experiment as realistic as possible, and no subject saw more than one reward system. No mention was made of coalitions, and no encouragement was given for their formation. A post-test was directed at examining the beliefs of subjects regarding the research purpose.

Each participant was placed in the role of departmental member, and briefed on the specific role they were to fill. A distinction should be made, however, between role playing and involved participation (Cooper, 1976). Role playing requires subjects to determine (pretend, imagine, or predict in Cooper's terms) how they would behave if they were in a hypothetical social setting, while involved participation requires the subject to actually react in a setting which manipulates the relevant behavioral stimuli (Cooper, 1976). Role playing is subject to the tendency on the part of people to want to appear cooperative, socially desirable, attractive, intelligent,

rational, and so forth. Subjects may be communicating their own ideal behavior or what they believe the experimenter expects. Involved participation allows participants to react spontaneously to the variables of interest. This study is an example of involved participation, in that the desire is to test hypotheses rather than construct them.

Based on the pretest, it was found that the most effective means of acquainting subjects with their roles was to give them individual job descriptions to read and absorb. They then met in a group with others assigned to the same departmental role to talk over what the role involved. They were encouraged, in these groups, to discuss the attributes or concerns they felt were important for their department in organizational purchase decisions. The job descriptions used were adapted from Job Descriptions in Manufacturing Industries, a publication of the American Management Association, and Job Descriptions, published by the Personnel Journal. The seven descriptions are included, in final form, in Appendix 1. These were shortened substantially as a function of the pretest. The researcher moved around the room answering questions and ensuring each department understood its role. The functional relationship between a given department and purchasing processes was explained. That is, the departmental group members were briefed concerning how purchase decisions affect their own task performance. The departmental concerns are summarized in Table 3.1.

While in this initial departmental meeting, once subjects were

Table 3.1: Functional Areas Included in Study, and Their
Primary Concerns in Purchasing Decision-Making

<u>Functional Area</u>	<u>Primary Concern in Purchase Decision-Making</u>
1. Design and Development Engineering	1. Name reputation of vendor; ability of vendors to meet design specifications;
2. Production	2. Delivery and reliability of purchases such that inter- ruption of production schedules is minimized;
3. Sales/Marketing	3. Impact of purchased items on salability of the company's products;
4. Maintenance	4. Degree to which purchased items are compatible with existing facilities and equipment; maintenance services offered by vendor; installation arrangements offered by vendors;
5. Finance/Accounting	5. Effects of purchases on cash flow, balance sheet, and income statement positions; variances in costs of materials over estimates; feasibility of make-or-buy and lease options to purchasing;
6. Purchasing	6. Obtaining lowest possible price at acceptable quality levels; maintaining good relations with vendors;
7. Quality Control	7. Assurance that purchased items meet prescribed specifications and tolerances, governmental regulations, and customer requirements;

introduced to their roles, they were presented with a purchasing problem to solve. The purchasing problems used in the experiment involved modified rebuy or new task purchases, requiring some deliberation and not typically made autonomously. In each case, it was a product that clearly impacted on each of the seven departments included. All purchases were for component parts used in manufacturing consumer durable products such as refrigerators, washers, and dryers by a hypothetical company called Dura-Prod. Each problem involved seven possible vendors from which departments were to choose. The vendor attributes were designed such that one was intended to meet the interests of each department. This was ensured by making adjustments to the vendor descriptions following an analysis of departmental preferences in the various pretests. The four purchasing problem scenarios used in this experiment can be found in Appendix 2. These include the "ice maker decision," the "transmission housing decision," the "tub assembly decision," and the "dryer motor decision."

Subjects in these initial departmental meetings were asked to identify their department's first, second, and third most preferred vendors in the "ice maker purchase decision." They were encouraged to discuss the attributes their department felt were most important in this practice decision. This concluded the initial meeting, and subjects were told to keep the job descriptions and to think over their roles prior to an ensuing meeting.

Subjects re-convened a few days later, and were grouped into their departments. Again, they were encouraged to think over their

departmental interests in purchase decisions, and the researcher was open to any questions. They were then given a second purchasing problem, and told to identify their department's first, second, and third most preferred vendors. The pretest had initially required them to rank-order all seven vendors, but this was not necessary because the rewards could be earned only as a function of a department's first, second, or third choices. Subjects were given fifteen minutes to come to their decisions, and observers then recorded the departmental vote. Forms used by the observers can be found in Appendix 3.

Subjects were then told they would be going to a group meeting consisting of one representative from each department to make an organizational buying decision concerning the purchasing problem just dealt with in their own department. Five such interdepartmental groups of seven members were created in this manner. A reward or point system was explained to them verbally and written copies of the explanation were distributed. All subjects faced the same type of reward system. For example, if the engineers were rewarded for taking a competitive attitude, then purchasing, production, finance, maintenance, marketing, and quality control representatives were also being rewarded for competing. These reward systems can be found in Appendix 4, and are explained below under the section entitled "independent variables." Subjects were told that they would be making three purchasing decisions in the department, and that they would return to the same interdepartmental group each time.

When in the interdepartmental or buying center group, the following procedure was followed: 1) each representative was encouraged to explain briefly his/her department's concerns in the decision, as they perceived those concerns; 2) ten minutes was allowed for discussion of the issues involved in the purchasing problem; 3) five more minutes were allotted for voting. A given buying center could take as many votes as it wanted, with the observer recording each person's final vote when time had expired. While a majority of four was always necessary to receive any points, subjects did not have to reach a majority.

Subjects then had a short break (during which they could freely interact) and returned to their departments to fill out the instrument measuring conflict and coalitions (discussed in section 3.6). They then repeated the entire process with the second and then the third decision problems. Following the third interdepartmental meeting they returned to their departments to fill out the instrument as well as the exit survey which included manipulation checks (see Appendix 5). At the same time, points were being tallied, and a \$25.00 cash prize was awarded to the top point getter after all forms had been completed. The pre-test indicated that \$25.00 was a salient amount for these particular subjects. These procedures are summarized in Figure 3.2.

Observers were students who knew nothing of the experimental purpose. They were carefully instructed to demonstrate attentiveness to all aspects of the group deliberations, both in the department

and, separately, in the buying center. They were told not to converse with the subjects, and to direct all questions to the researcher. In addition to recording vendor preferences (of the department) and votes (in the buying center), they provided descriptions of any distinguishing aspects of the group's deliberations, and indicated their opinions on closed-ended measures of coalition formation and conflict in the buying center. Observers were explained as a representative of management, but only for observation purposes. It was stressed that this person had nothing to do with the negotiations or the decisions being made, except in the cooperative reward treatment, as explained below. As a result of the observers, it was felt that the situation took on a more serious, realistic tone.

While realism might also be added by including differential resource-power positions, this is likely to represent a confound. Gruder (1970, p. 127) explains that equal resources among group members should result in the least difficulties in dividing the winning share. As a result, coalitions should form primarily as a means of reducing total conflict rather than in response to differences in resources or power.

3.5 INDEPENDENT VARIABLES

3.5.1 Cooperative Reward System

A given reward system involved the allocation of points based on criteria specific to that system, either cooperative, competitive, or independent. In the cooperative reward treatment individuals were rewarded on the basis of how well the buying center group acts

in a manner which serves the overall organization's needs. They were told that all members of a given buying center would receive the same number of points, but that the actual amount would vary as a function of how well all of the group members work cooperatively to resolve their differences and establish common interests. Specifically, subjects were told that the point award was based on the observer's evaluation of how much the final decision reflected a creative means of meeting all the departmental interests. In fact, however, points were allotted based on the final vote. Three points were assigned where the majority consisted of a unanimous consensus. Two points were awarded if the majority consisted of five or six. One point was awarded if a decision was reached, but the majority was only four of the seven subjects. Zero points were awarded if no majority decision was reached. Participants were not told that this was how points were actually being allocated, for that would simply encourage them to abandon their departmental interests and vote in unison for any vendor. This approach removes the need for a subjective evaluation by the observer, while leading participants to believe that such an evaluation is taking place.

3.5.2 Competitive Reward System

The competitive reward condition involved the creation of a zero-sum game scenario, where one person's gains come at the expense of all the other participants. To accomplish this, the subject in the buying center whose department ranked the winning vendor highest was awarded three points, while all others in that buying center

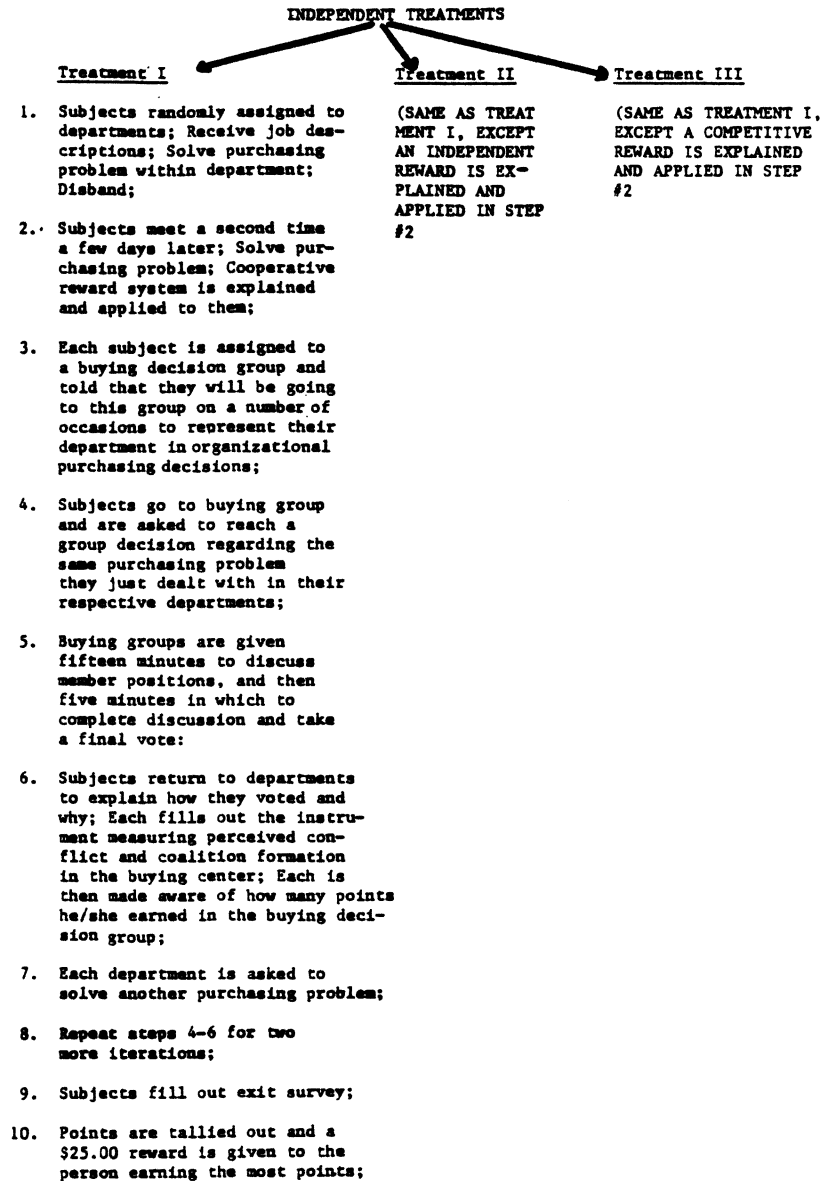


Figure 3.2: Illustration of the Experimental Procedure

received zero points. Thus, if a majority voted for a given vendor, the representative of the department ranking that vendor highest was the winner for that decision. If no majority was reached, then none of the members of that buying center received any points. Combining this with the fact that only one \$25.00 prize was available strongly encouraged competitive strategies.

3.5.3 Independent Reward System

The independent reward treatment was somewhat similar to the competitive condition, but the differences between the two leave the independent reward equivalent to a mixed competitive-cooperative arrangement. Each representative received a point award which was directly proportional to the distance between the buying center's vendor decision and the ranking that vendor was given in the department. If the winning vendor was the first preference of a subject's department, then that subject was awarded three points. If the winning vendor was his/her department's second choice, two points were awarded. If the winner was a department's third choice, that representative received one point. If the winner was not ranked by a person's department, or if no majority was reached, zero points were assigned. In this manner, the winner-take-all feature of the competitive arrangement was eliminated, and subjects were left with a mixed-motive bargaining situation.

The use of a maximum award of three points in each decision iteration was decided upon as a result of the pretest. It enabled virtually all participants to remain in the running for the overall

\$25.00 prize through most of the experiment. A larger point award made this less possible. Subjects were individually told of the number of points each had accrued from a given decision problem after they returned to their department following that decision. They were told of their performance in the presence of only the others members of their department. Again, Appendix 4 includes the descriptions of the reward systems as provided to the participants.

The absence of any control group is due to concerns about its meaningfulness. In this experiment, a control situation would involve the absence of any reward system. However, such would not seem likely, for even if the experimenter offered no formal rewards, subjects are likely to behave according to some informal set of perceived intrinsic rewards that are a function of the format of the exercise. So, rewards would still be operating. This experiment has institutionalized those rewards in the form of points.

3.6 DEPENDENT VARIABLES

3.6.1 Perceived Conflict

In an evaluation of measures used to assess conflict behavior, Thomas (1976, p. 931) concludes "...despite its popularity as a topic, empirical research on conflict behavior in organizations is still somewhat sparse." A limited number of instruments do exist, and these involve self-reports by subjects. Unfortunately, little validity data exists concerning these measures. The major validity concerns appear to involve problems with subjects comprehending and distinguishing some of the behavioral categories, and the presence

of a social desirability bias in subject responses (Thomas, 1976). These problems, combined with an interest in the group as the unit of analysis, suggest a need to go beyond the conflict literature to examine how conflict is approached in the literature on group behavior. One promising treatment can be found in the Group Dimensions Questionnaire (Hemphill, 1956).

The Group Dimensions Questionnaire contains 150 statements drawn from an initial set of 1100 items. Each item pertains to a subject's attitudes toward and perceptions of a specific group to which he/she belongs. Subjects respond to each item by selecting one of the following Likert-type alternatives: A) Definitely true; B) Mostly true; C) Neither true nor false; D) Mostly false; E) Definitely false. Hemphill used judges to assign the items to thirteen dimensions and demonstrated the independence of these dimensions from one another. The specific dimensions are autonomy, control, flexibility, hedonic tone, homogeneity, intimacy, participation, permeability, polarization, potency, stability, stratification, and viscosity. Scores for each dimension are attained by summing the responses to the questions for that dimension. In a manual prepared to aid in using the questionnaire, Hemphill (1956) reports normalized scores for a standard population, in addition to validity and reliability data drawn from applications of the instrument to a number of different types of groups. Hare, Borgatta, and Bales (1965) have performed some additional analyses on these dimensions, concluding that they are not as independent as initially thought, and that a sizable amount of

overlap may exist. They suggest that fewer than thirteen dimensions are actually being measured. More recently, Lake, Miles and Earle (1973, p. 92) have also pointed out problems in the mutual independence of dimensions, but conclude that "some of the more reliable dimensions, such as autonomy (mean reliability - .88), intimacy (.83), polarization (.83), and viscosity (.88) can probably be used without undue concern."

In the pretest, perceived conflict was measured by using Hemphill's items concerning polarization and viscosity. Polarization is defined (Hemphill, 1956, p. 4) as "the degree to which a group is oriented and works toward a single goal which is clear and specific to all members." Viscosity refers to "the degree to which members of the group function as a unit. It is reflected by absence of dissension and personal conflict among members, (and) by absence of activities serving to advance only the interests of individual group members." Hare, Borgatta and Bales (1965) indicate that these two measure what they term task-focused agreeable cooperativeness vs. conflict. As a result, they were considered as two separate measures of perceived conflict within the group. The use of both is supported by Lake, Miles, and Earle (1973). Both polarization and viscosity were measured by twelve items each in Hemphill's original work.

Of these two constructs, only viscosity demonstrated reliability in the pretest. It is, however, closer definitionally to the group conflict construct of interest in this dissertation. The low reliabilities for polarization may reflect inconsistency among respondents

due to perceived ambiguity in goals and differences in the relative importance of individual versus group objectives. The polarization reliability was highest in the cooperative treatment, where subjects were rewarded for identifying and pursuing their mutual interests. Thus, the results suggested consistency was evident in terms of a measure of conflict, but not in terms of the group's working toward a single goal. Further, of the twelve items measuring viscosity, three consistently (across all treatments) reduced Cronbach's alpha. Upon elimination of these items, reliabilities for the remaining nine-item conflict measure were: .934 in the independent reward treatment, .901 in the cooperative treatment, and .902 in the competitive treatment. The instrument used in the actual experiment included this conflict measure, together with the Norton coalition measure described below, and is found in Appendix 6.

3.6.2 Coalition Formation

The measurement of coalitions presents quite a different challenge. The social psychology research on coalitions is an outgrowth of game theory research. As such, researchers attempt to relax the assumptions of a game theoretic approach in order to produce results which are more descriptive and less normative. Coalitions are typically examined in three or four person groups, where variables such as resource positions, payoffs, communication linkages, or bargaining experience are manipulated. Coalitions are usually measured by requiring subjects to select specific individuals in the group to whom they will make offers, negotiate, and establish some agreement

regarding the joint use of resources (see Komorita and Meek, 1978, for a discussion of commonly used procedures in coalition experiments). The agreement generally specifies a reward distribution within the coalition. In many studies, subjects are told to either send messages to one another or are allowed to meet separate from the group in order to negotiate. Coalitions are identified in terms of written or observed agreements, or self-reports of agreements. The objectives in this body of research are to determine which coalitions form, the characteristics of winning coalitions, and the distribution of payoffs. Little concern is found for whether or not coalitions form at all, in that they are preordained by the design of the experiment. Such approaches offer little in terms of a methodology for measuring coalitions in a more objective or natural group setting, where they do not have to form and are not encouraged. That is, these approaches are of little help in a research setting where coalitions are a logical behavioral response that has not been artificially prompted.

This dissertation relies upon the generally accepted definition of coalitions used by social psychologists. The standard definition is that a coalition is a subset of a group which agrees to cooperate in the joint use of resources so as to effect the outcome of a decision in order to maximize rewards (Komorita and Meek, 1978). The identification of such coalitions is an ongoing problem with which social scientists continue to grapple. Michener and Lyons (1972) have described their use of a few direct attitudinal measures, but provide no validity or reliability information, and their experiment

strongly encouraged subjects to form coalitions. Anzai (1977, p. 404) observes, "Even though coalition is one of the most explicit interactions in human groups, we find it quite difficult to detect the existence of a coalition, unless unusual behavior of one or more members is recognized." He presents a novel means to enable such detection utilizing a computer programmed to play Chinese checkers with subjects. Where player strategies differ significantly from an expected sequence of moves, the computer determines that the subjects are collaborating as a coalition. Again, this is not especially helpful in the current application, but demonstrates the lengths to which researchers are going to address the problem.

Another approach used by social psychologists, game theorists, and political scientists is to have the group vote on some decision, and interpret the vote as a behavioral representation of any coalitions which might exist. In the case of a vote, the nature of the group outcome is being used to define coalitions. For example, if a vote tally on some group decision is 3-2-1 in a six person group (three people vote for one position, two for another and one for another), then it is deemed that two coalitions have formed. This research utilized a modified voting procedure to measure coalition formation. Specifically, the number of vendors receiving no votes in a given purchasing decision was used as the dependent measure. It is especially useful in this application, in that it provides an indication of the grand coalition and the total deadlock, as well as any combined efforts between or among subjects. As was discussed

earlier in the hypotheses, a cooperative reward may well lead to the grand coalition, while a purely competitive reward may result in each subject maintaining his/her position such that the group ends in a complete deadlock. If this is the case, it can be expected that the cooperative treatment will result in virtually all of the votes going to one vendor, with six vendors receiving no votes. Similarly, the competitive treatment should result in each of the seven vendors getting one vote. The independent or mixed motive treatment should give rise to clusters of subjects (coalitions) supporting two or three vendors. Such an "ideal case" is illustrated in Table 3.2.

Table 3.2: Example of Hypothesized Vote Distribution
Among Vendors Under Cooperative, Independent,
and Competitive Reward Systems

<u>Vendor</u>	<u>REWARD TREATMENT</u>		
	<u>Cooperative</u>	<u>Independent</u>	<u>Competitive</u>
1	XXXXXXX	XXX	X
2			X
3			X
4		XX	X
5			X
6			X
7		XX	X

X = 1 vote

As can be seen, the mean number of vendors receiving no votes should approximate six (high) in the cooperative treatment, three or four in the independent treatment, and zero (low) in the competitive treatment. Both the high and low outcomes are indicative of few coalitions. Further, the voting outcomes provide an intervally-scaled measure which enables the comparison of group means in an Analysis of Variance (ANOVA) procedure. It is expected that the means will vary significantly from one another.

One drawback to using a vote is that it is an outcome which follows from various individual strategies such as coalition formation. While it may be a good indicator of any coalitions which form, it is conceivable that two people would vote the same way without forming a coalition. However, by voting together any subset of the group can be effectively regarded as a passive coalition, even if they did not actively agree to coalesce. Because conflicting orientations have been attributed to departments, any combined voting represents compromise on at least one subject's part.

A promising development in the area of measurement is an algorithm designed by Norton (1979 a, b) entitled "the coalition game," which utilizes linkage analysis and sociometric basis for identifying coalitions. The technique is based on the assumption that coalitions form as a function of the popularity of individuals and the strength of interpersonal attraction. However, Norton notes that popularity can be replaced by some other basis for coalition formation. Analyzing all possible dyads in a group, the algorithm produces numerical

weights for each dyad which account for the strength of that dyadic relationship (reciprocity) and the total influence of the dyad within the group. Based on these weights, a clustering technique such as elementary linkage analysis (McQuitty, 1957) can be used to identify coalitions and graphically demonstrate the group structure.

As a second measure of coalition formation, this dissertation uses a slight modification of Norton's coalition game. The technique was implemented according to the following steps. First, following the buying center decision, just after subjects return to their departmental groups, they were asked to indicate (1) the person with whom they worked most closely, (2) the next most closely worked with person, and (3) the person worked with third most closely. Subjects had the option of not specifying any or all of the three if they did not work especially closely with that many others. If a subject was selected by another subject as most closely worked with, he/she was assigned three work attraction units for the purpose of analysis. Second-most worked with group members received two work attraction units, and third most worked with group members received one work attraction unit. A matrix could be constructed of all the work attraction units assigned by every subject to every other subject. This is insufficient for identifying coalitions, however, for reciprocity has not been considered. One person may have received a lot of work attraction units, but belong to no coalition. Thus, all possible dyads were examined. There were always $n(n-1)/2 = 21$ dyadic relationships in a buying center. The total units of work attraction

within each dyad were added together, and called (A). This sum enabled the identification of coalitions based on the elementary linkage technique (McQuitty, 1957). Norton (1979) suggests a decision rule of $A = 5$. That is, a matrix of work attraction units for each dyad was constructed, and coalitions were identified for any links whose strength was $A = 5$ or greater. An example of such matrices is found in Appendix 8.

3.7 MANIPULATION CHECKS

Responses to the exit survey (see Appendix 5) provided a number of variables which constitute manipulation checks for the three reward treatments. Subjects were asked an open-ended question concerning their interpretation of how the point system worked, as well as three scaled-response items concerning the degree to which the rewards and the point system encouraged cooperation, competition, or both. Subjects were also asked an open-ended question concerning what they thought the researcher's purpose was in the experiment.

Other questions on this survey were directed at determining how well the respondent understood the instructions and his/her role. These included questions concerning how to earn points and what their departmental concerns were in purchasing decisions and overall. Finally, respondents were asked closed-ended questions concerning how realistic the exercise was, how much difference they saw among the vendors, how salient the \$25.00 reward was, and whether they tended to work alone or form coalitions.

3.8 ANALYSIS

The data analysis utilizes repeated measures analysis of variance (ANOVA) to compare the mean effect of each reward treatment on perceived conflict as well as coalition formulation (BMPD, 1977). In addition, a series of one-way ANOVA's were run, with a posteriori contrasts. The analysis of variance is directed at resolving three questions: (1) was there a learning effect over decisions?; (2) were buying centers within a treatment behaviorally homogeneous?; and (3) were there significant differences in perceived conflict and in coalition formation between treatments, as hypothesized? Any given observation (X_{ijk} in Figure 3.1) should be influenced by any effect due to differences in buying centers (despite random assignment), and any effect due to the reward treatments themselves. This is illustrated in the following linear model:

$$X_{ijk} = \mu + B_i + D_j + T_k + E_{ijk} \quad (\text{equation 3.1})$$

X_{ijk} = observation for the i^{th} buying center, on the j^{th} decision, within the k^{th} treatment

μ = grand mean for coalitions or conflict

B_i = effect due to differences in buying centers

D_j = effect due to differences between decisions in a treatment

T_k = effect due to the treatments (rewards)

E_{ijk} = error term

The repeated measures ANOVA is used to address the question concerning any treatment effect, while partitioning out any effect due to the repeated decisions. Oneway ANOVA, run across decisions within each treatment, is also used to analyze the nature of any learning effects. Coalition formulation and conflict are also averaged across decisions, with the result used in a oneway ANOVA. To the extent that there are no significant learning effects, the overall test of differences between treatments can be based on all fifteen observations per treatment. Any effects due to buying center differences are similarly identified with oneway ANOVA.

The power of the tests for the research hypotheses is estimated and reported, based on the calculated effect sizes. An attempt is also made to assess the reliability of the nine items used to measure perceived conflict, and the two procedures used to measure coalition formation.

Chapter 4

RESULTS

4.1 MANIPULATION CHECKS

To determine if the reward systems created sufficiently competitive, cooperative, or mixed scenarios, three questions served as manipulation checks in the exit survey (see Appendix 7). These items consisted of five-point scales measuring 1) the degree to which the reward system encouraged competitiveness, 2) the degree to which the reward system encouraged cooperativeness, and 3) a competitive-cooperative continuum. As can be seen in Figure 4.1, the cooperative reward treatment resulted in a very cooperative orientation in terms of all three items. Similarly, the competitive reward treatment was successful at creating a sufficiently competitive environment. It appears that the independent reward treatment created a mixed-motive scenario, as expected, but that the competitive motives were stronger than the cooperative motives. However, Rosenbaum, et al (1980) have suggested that competitiveness will tend to dominate cooperative incentives in a mixed-motive or independent reward scenario.

To compare results for each of these items across the three treatments, oneway analysis of variance (ANOVA) was run with Least Significant Differences (LSD) and Scheffe a posteriori contrasts. As reported in Tables 4.1a, 4.1b, and 4.1c, significant differences were found across treatments for these items. However, the contrasts indicated that there were significant differences among all three

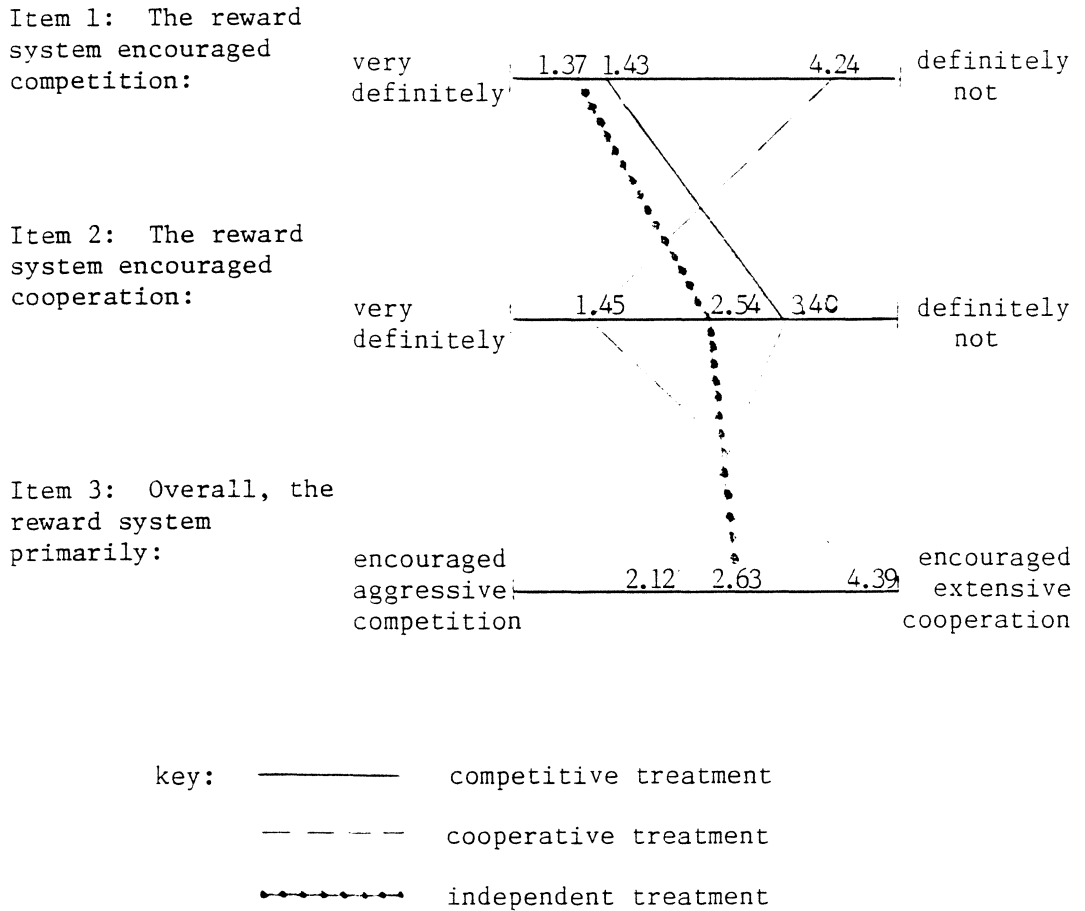


Figure 4.1: Mean Values for Manipulation Checks on the Competitive, Cooperative, and Independent Reward Treatments (5-point scale)

TABLE 4.1a

Summary Table: Oneway ANOVA on the Degree to Which
the Reward System Encouraged Competitiveness
(Item #1) across the Three Reward Treatments

Source	d.f.	SS	MS	F	Significance
Between Groups	2	178.33	89.17	102.84	$\leq .001$
Within Groups	97	84.11	.87		
Total	99	262.44			

TABLE 4.1b

Summary Table: Oneway ANOVA on the Degree to which the
Reward System Encouraged Cooperativeness
(Item #2) across the Three Reward Treatments

Source	d.f.	SS	MS	F	Significance
Between Groups	2	62.25	31.13	20.88	$\leq .001$
Within Groups	97	144.59	1.49		
Total	99	206.84			

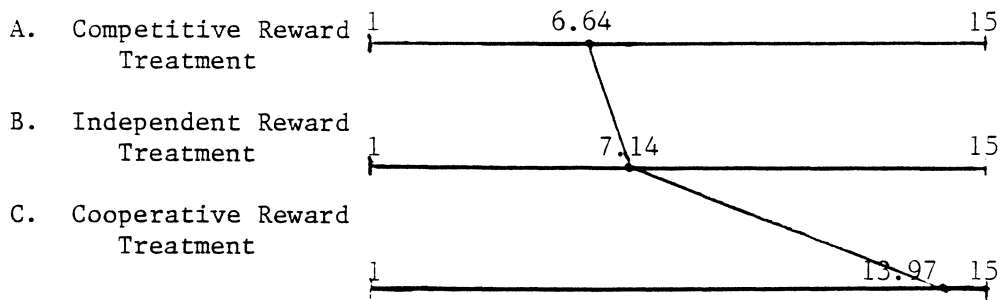
TABLE 4.1c

Summary Table: Oneway ANOVA on the Subject Evaluations
of Reward Systems on a Competitive-Cooperative
Continuum (Item #3) across the Three Reward Treatments

Source	d.f.	SS	MS	F	Significance
Between Groups	2	93.19	46.59	58.29	$\leq .001$
Within Groups	97	77.55	.79		
Total	99	170.75			

treatments for items #2 and #3, but not for item #1. In the case of item #1, the measure of competitiveness, the independent and competitive treatments differed significantly from the cooperative treatment, but not from one another. This further supports the finding that the competitive and cooperative reward systems were manipulated as desired, while the independent treatment resulted in stronger competitive motives than expected.

Additionally, responses to these three items were summed, and ANOVA with a posteriori contrasts were run to determine if the resultant scale differed significantly among treatments. The response scale on the second item was reversed, so that the lower totals across the three items could be associated with competitiveness, and higher scores could be associated with cooperativeness. An internal consistency measure of reliability (Cronbach's alpha) was also run on this three-item scale, generating an alpha value of .812. While no precise guidelines have been developed for evaluation of reliability coefficients in marketing research, Peter (1979) suggests that Nunnally's standards are high, and that a range of .70 to .80 may be acceptable. The ANOVA results are reported in Table 4.2, and the contrasts are illustrated in Figure 4.2. The competitive and independent treatments differed significantly from the cooperative treatment, but not from each other. It appears that the stronger degree of cooperativeness encouraged by the independent treatment (relative to the competitive treatment) was offset by the extensive competitive motive in that treatment. Thus, the



(Note: Higher Scores Reflect Greater Cooperation)

Figure 4.2: Comparison of Three Reward Treatments on the 3-Item Summated Scale for Competitive-Cooperative Manipulation Checks

TABLE 4.2

Summary Table: Oneway ANOVA on the Three-Item
Competitive/Cooperative Summated Scale
Across the Three Reward Treatments

Source	df	SS	MS	F	Significance
Between Groups	2	1114.23	557.16	42.31	< .001
Within Groups	92	1211.52	13.17		
Total	94	2325.75			

TABLE 4.3

Summary Table: Oneway ANOVA on
Perceptions of Vendor Similarity
Across the Three Reward Treatments

Source	df	SS	MS	F	Significance
Between Groups	2	.75	.38	.316	.729
Within Groups	97	115.76	1.19		
Total	99	116.51			

three item scale does not significantly discriminate between the competitive and independent reward systems, although items two and three in the scale do discriminate.

Other questions on the exit survey were directed at respondent perceptions of vendor similarity, the realism of the experiment, and reward saliency. On a five point scale (1 = extremely similar and 5 = extremely different), subjects found the vendors to be not especially similar or different. As expected, no significant differences existed among treatments on this item ($\bar{x}$ = 3.063, 2.971, and 3.182 for the competitive, independent, and cooperative treatments, respectively) based on the ANOVA results summarized in Table 4.3. In response to a scale where 1 = very realistic and 5 = very unrealistic, subjects apparently felt they were participating in an experiment that was fairly realistic in representing decision-making in an actual organization. No significant differences were found in respondent perceptions of realism among the competitive ($\bar{x}$ = 2.563), independent ($\bar{x}$ = 2.571) and cooperative ($\bar{x}$ = 2.242) treatments, as demonstrated in Table 4.4. These findings, combined with written comments observers and subjects made on the motives, tactics, and intensity displayed by other subjects, would seem to indicate that they approached the decision-making process fairly seriously. The \$25 reward appears to have been sufficiently salient, as measured on a five-point scale where 1 = a very significant impact (of the reward on a person's behavior) and 5 = no impact at all. Results for the contrasts indicated this saliency was significantly greater

TABLE 4.4

Summary Table: Oneway ANOVA on
Perceived Realism of Experiment
Across the Three Reward Treatments

Source	df	SS	MS	F	Significance
Between Groups	2	2.33	1.17	1.37	$\leq .259$
Within Groups	97	82.51	.85		
Total	99	84.84			

TABLE 4.5

Summary Table: Oneway ANOVA on the Saliency
of the \$25 Reward
Across the Three Reward Treatments

Source	df	SS	MS	F	Significance
Between Groups	2	11.05	5.52	4.46	$\leq .014$
Within Groups	97	120.11	1.24		
Total	99	131.16			

in the independent ($\bar{x} = 2.34$) treatment than in the cooperative ($\bar{x} = 2.90$) or competitive ($\bar{x} = 3.12$) treatments. The ANOVA results are reported in Table 4.5.

Open-ended questions were included which addressed whether or not subjects had surmised the actual purpose of the experiment, how well subjects understood their departmental roles, and how well they comprehended the manner in which points could be earned. None of the respondents indicated anything close to the actual purpose, and most indicated that the study was concerned with approaches to decision-making between departments in a firm. Subjects appeared to clearly understand their departmental concerns and the point systems. Data from the exit survey is summarized in Appendix 6.

4.2 ANALYSIS OF DEPENDENT VARIABLES

The effects of the reward manipulations on perceived conflict and coalition formation are assessed in accord with the following procedure: first, a summary analysis of the data is provided; second, results of multivariate and univariate tests on the variance in conflict and coalition formation across treatments are presented; third, specific results concerning the research hypotheses for each reward treatment are reported; and fourth, the effect sizes and power of the tests are discussed.

4.2.1 Overview of the Data

Conflict, as measured by nine items representing viscosity on Hemphill's (1956) Group Dimensions Questionnaire (see section 3.5), was an individual-level variable. Reliability was measured

for this scale using Cronbach's alpha, resulting in coefficients similar to those found in the pretest. For the competitive, independent, and cooperative treatments, respectively, alpha was equal to .878, .892, and .985. These would appear to be acceptable levels of reliability (Peter, 1979). An item analysis indicated reductions would result in coefficient alpha if any questions in the scale were deleted.

This scale of items was administered to each subject following each buying decision. However, the unit of analysis in this research is the buying group. As a result, after summing the nine items for each person, the resultant scaled responses were averaged across the seven members of each buying center. This provided a group measure of perceived conflict for each buying center on each buying decision. These computed means are reproduced in Table 4.6, where low mean values indicate greater perceived conflict.

As can be seen in Table 4.6 as well as in Figure 4.3, the directionality of the data is consistent with the research hypotheses. Perceived conflict is highest in groups reacting to the competitive reward system, lowest in groups responding to the cooperative reward system, and intermediate in groups facing the independent reward system. Moreover, these differences are consistent for each of the three decisions, and for all five of the buying centers, in each reward treatment.

Two measures of coalition formation were used in this research, and these will be referred to as the Norton measure and the Vote

TABLE 4.6

Mean Values after Summing
Perceived Conflict at the Group Level,
by Decision and Treatment

Competitive
Treatment:

	<u>Decision #1</u>	<u>Decision #2</u>	<u>Decision #3</u>	<u>Average across</u> <u>Decisions</u>
Buying center #1	27.2	24.5	23.1	25.0
Buying center #2	28.2	27.4	23.5	26.4
Buying center #3	25.1	24.7	27.4	25.7
Buying center #4	24.5	24.4	23.2	24.0
Buying center #5	22.4	25.8	23.5	23.9
Average across Buying centers	<u>25.5</u>	<u>25.4</u>	<u>24.2</u>	<u>25.0</u>

Cooperative
Treatment:

	<u>Decision #1</u>	<u>Decision #2</u>	<u>Decision #3</u>	<u>Average across</u> <u>Decisions</u>
Buying center #1	43.7	38.8	46.1	42.90
Buying center #2	35.5	35.4	44.7	38.57
Buying center #3	36.7	37.4	42.8	39.00
Buying center #4	39.7	44.0	44.0	42.57
Buying center #5	42.1	48.0	47.7	45.95
Average across Buying centers	<u>39.6</u>	<u>40.7</u>	<u>45.1</u>	<u>41.8</u>

Independent
Treatment:

	<u>Decision #1</u>	<u>Decision #2</u>	<u>Decision #3</u>	<u>Average across</u> <u>Decisions</u>
Buying center #1	27.2	30.4	31.4	29.71
Buying center #2	32.8	35.0	30.7	32.86
Buying center #3	35.5	33.0	27.7	32.09
Buying center #4	29.1	25.0	27.2	27.14
Buying center #5	36.1	32.1	25.0	31.09
Average across Buying centers	<u>32.2</u>	<u>31.1</u>	<u>28.4</u>	<u>30.6</u>

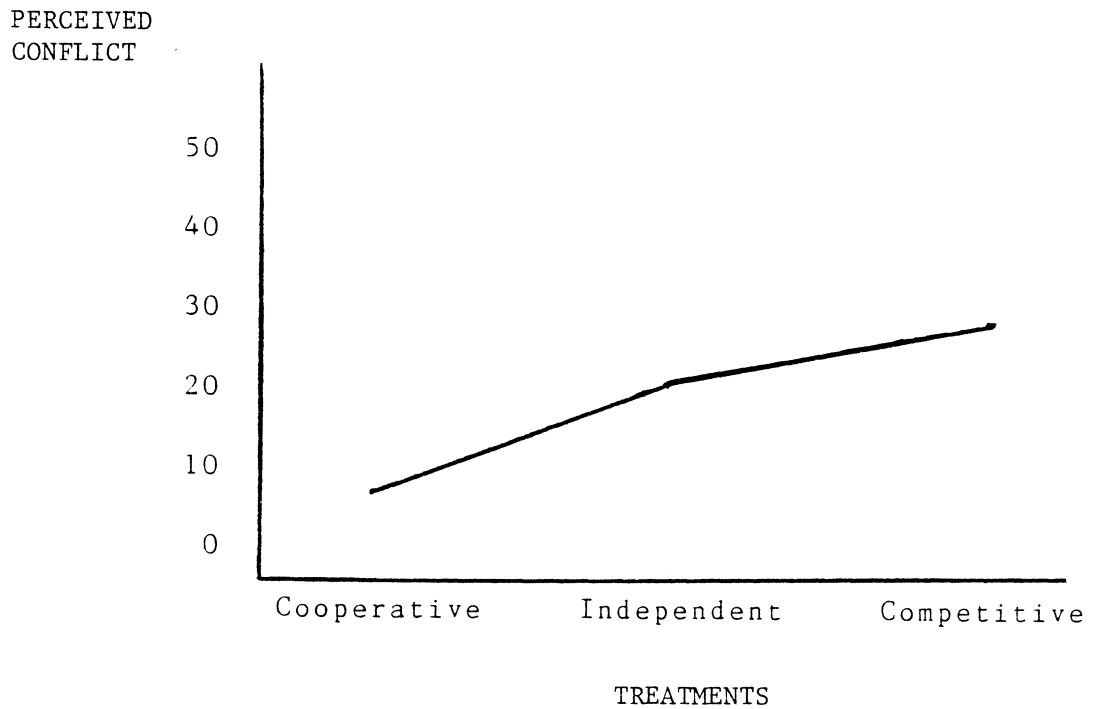


Figure 4.3: Average Level of Perceived Conflict per Decision in Each Treatment (Note: Scale is Reversed)

measure (see section 3.6.2 for a discussion of each). Tables 4.7a and 4.7b include summary information concerning the number of coalitions or of vendors receiving no votes in each buying center for each reward treatment. Given that these are two measures of the same construct, an attempt was made to assess their reliability. The number of coalitions in each treatment for decision #1 under the Norton measure was correlated (Pearson's) with the number of coalitions for decision #1 under the Vote measure. Results for decision #2 and for #3 under each measure were similarly correlated. That is, the first column in Table 4.7a was correlated with the first column in Table 4.7b, the second with the second, and so on. The sign for all of these correlations was in the expected direction (see Table 4.7c). Each was negative, which is consistent with the fact that the Norton measure provides an absolute number of coalitions forming, while the vote is a measure of the number of vendors receiving no votes. The Vote measure was arrived at by calculating the number of vendors (of seven) not receiving any votes from the seven members of a buying center. However, only the coefficient for decision #1 across all three treatments was statistically significant ($r = -.59$, $p = .01$). When correlating these measures across treatments, buying centers, and decisions ($n = 45$), a significant coefficient is found ($r = -.31$, $p = .02$), as reported in Table 4.7d.

One explanation for this lack of convergent validity may be the fact that the Vote is a more global measure of coalitions. That is, it is a measure based on group outcomes, while Norton is

TABLE 4.7a

Number of Coalitions in each Buying Center
by Treatment and Decision,
Using the Norton Measure

Competitive
Treatment:

	<u>Decision #1</u>	<u>Decision #2</u>	<u>Decision #3</u>	<u>Average across Decisions</u>
Buying center #1	3	2	3	2.67
Buying center #2	2	1	1	1.33
Buying center #3	3	2	2	2.33
Buying center #4	3	4	3	3.33
Buying center #5	4	3	3	3.33
Average across Buying centers	<u>3</u>	<u>2.4</u>	<u>2.4</u>	<u>2.59</u>

Cooperative
Treatment:

	<u>Decision #1</u>	<u>Decision #2</u>	<u>Decision #3</u>	<u>Average across Decisions</u>
Buying center #1	2	3	2	2.00
Buying center #2	1	1	2	1.33
Buying center #3	3	1	2	2.00
Buying center #4	0	1	0	.33
Buying center #5	1	1	2	1.33
Average across Buying centers	<u>1.4</u>	<u>1.2</u>	<u>1.6</u>	<u>1.40</u>

Independent
Treatment:

	<u>Decision #1</u>	<u>Decision #2</u>	<u>Decision #3</u>	<u>Average across Decisions</u>
Buying center #1	3	3	3	3.00
Buying center #2	4	3	3	3.33
Buying center #3	2	3	3	2.67
Buying center #4	3	4	4	3.67
Buying center #5	3	3	4	3.33
Average across Buying centers	<u>3</u>	<u>3.2</u>	<u>3.4</u>	<u>3.20</u>

TABLE 4.7b

Number of Vendors Receiving No Votes
in each Buying Center,
by Treatment and Decisions

Competitive
Treatment:

	<u>Decision #1</u>	<u>Decision #2</u>	<u>Decision #3</u>	<u>Average across Decisions</u>
Buying center #1	4	5	5	4.66
Buying center #2	3	4	4	3.66
Buying center #3	3	4	4	3.66
Buying Center #4	4	4	2	3.33
Buying center #5	4	3	3	3.33
Average across Buying centers	<u>3.6</u>	<u>4</u>	<u>3.6</u>	<u>3.73</u>

Cooperative
Treatment:

	<u>Decision #1</u>	<u>Decision #2</u>	<u>Decision #3</u>	<u>Average across Decisions</u>
Buying center #1	6	5	6	5.66
Buying center #2	6	4	5	5.00
Buying center #3	6	6	6	6.00
Buying center #4	6	6	5	5.66
Buying center #5	6	5	5	5.33
Average across Buying centers	<u>6</u>	<u>5.2</u>	<u>5.4</u>	<u>5.52</u>

Independent
Treatment:

	<u>Decisions #1</u>	<u>Decision #2</u>	<u>Decision #3</u>	<u>Average across Decisions</u>
Buying center #1	4	5	5	4.66
Buying center #2	4	5	5	4.66
Buying center #3	5	5	5	5.00
Buying center #4	5	6	5	5.33
Buying center #5	5	5	4	4.66
Average across Buying centers	<u>4.6</u>	<u>5.2</u>	<u>4.8</u>	<u>4.87</u>

Table 4.7c: Pearson Correlation Coefficients
Between the Norton and Vote Measures of
Coalitions on Each Purchasing Decision
(n=15)

	Vote Decision #1	Vote Decision #2	Vote Decision #3
Norton Measure Decision #1	-.59 (p = .01)	—	—
Norton Measure Decision #2	—	-.09 (p = .37)	—
Norton Measure Decision #3	—	—	-.20 (p = .23)

Table 4.7d: Pearson Correlation Coefficients
Between Perceived Conflict, Coalitions
Using the Norton Measure, and Coalitions
Using the Vote Measure
(n=45)

	Perceived Conflict	Norton Coalition Measure	Vote Coalition Measure
Perceived Conflict	—		
Norton Measure	-.55 (p=.001)	—	
Vote Measure	.64 (p=.001)	-.31 (p=.02)	—

based on the group process. In a sense, a vote may capture both overt and latent coalescing activity. This distinction is a subjective one. It is meant to refer to a difference between expressed and even observable cooperative alliances where people work together, and de facto alliances where people behave (vote) in a similar way due to their shared interests. Alternatively, the Norton measure is based only on expressed statements concerning those with whom subjects worked most closely during the group process. Two people may have worked together to overrule the vendor preferences of a third, while not necessarily supporting one another's vendor preferences. To this extent, they would not have voted together. The Norton measure identifies a coalition which the Vote measure does not. Both are saying something meaningful about coalitional behavior, but they do not appear to correlate significantly.

As with the conflict data, the directionality of the coalition data is consistent with the research hypotheses. It can be seen in Table 4.7a that coalitions, as identified by the Norton measure, are more numerous under the independent reward system than under the competitive or cooperative reward systems. This is graphically demonstrated in Figure 4.4. However, it was also expected that the number of coalitions would be approximately the same in both the cooperative and competitive treatments. This was not the case, in that the competitive reward treatment resulted in a level of coalition formation in between that found under the independent and cooperative treatments. It can be noted, though, that the results

COALITIONS

(Norton Measure)

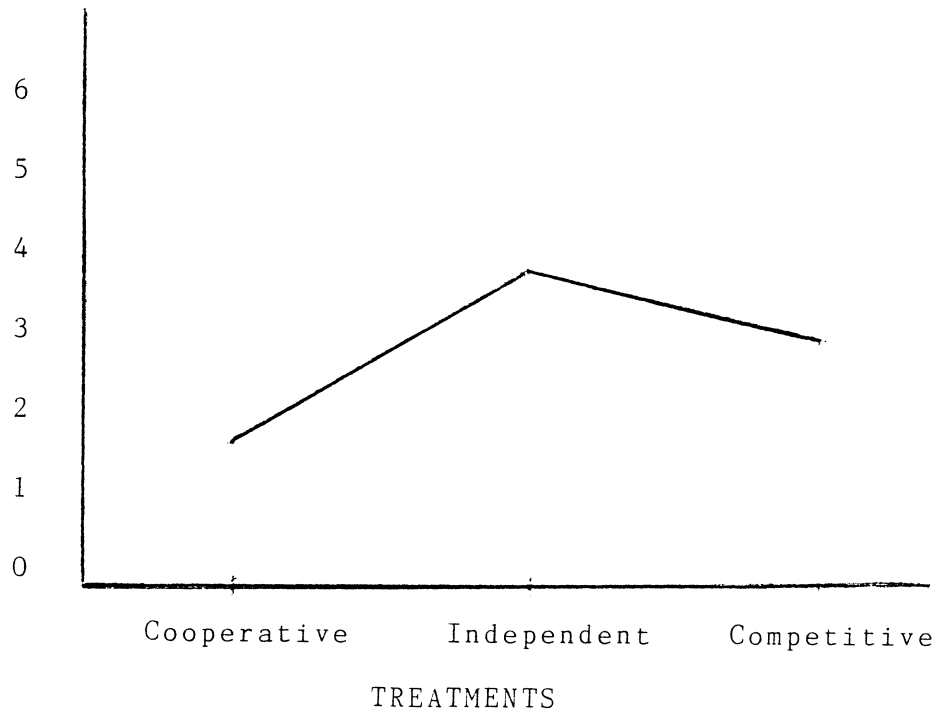


Figure 4.4: Average Amount of Coalition Formation per Decision in Each Treatment, using the Norton Coalition Measure

COALITIONS

(# of Vendors
Receiving No Votes)

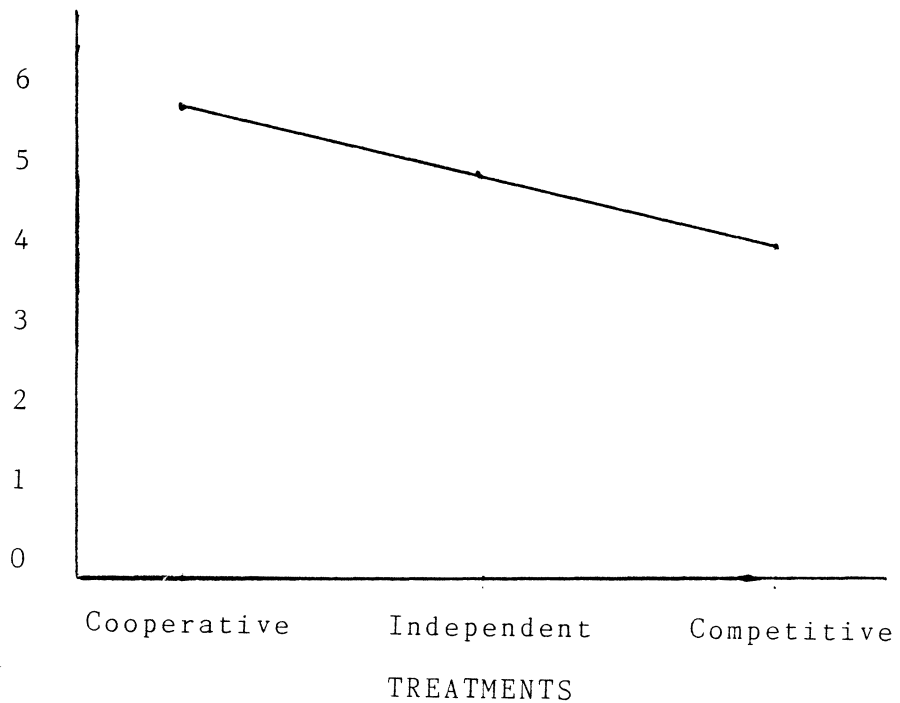


Figure 4.5: Average Number of Vendors Receiving No Votes per Decision in Each Treatment

do approximate the predicted inverted U-shaped curve (see discussion in section 2.4.1). That is, it was expected that the level of coalition formation would rise and then fall as one moved from a cooperative to an independent reward system, and then from an independent to a competitive reward system. The fact that there was more coalition formation than expected in the competitive treatment suggests that individuals did not choose to pursue their own interests with total disregard for those of every other group member. Again, the competitive reward created a zero-sum scenario.

In Table 4.7b and Figure 4.5 it can be seen that the number of vendors receiving no votes is highest in the cooperative treatment and lowest in the competitive treatment. Thus, the results for the cooperative treatment are in the direction of a grand coalition, the competitive treatment results are in the direction of a deadlock, and the independent treatment results tend toward coalitions. These results support the expectations presented in Table 3.2 concerning the idealized vote distribution, where only one vendor was expected to get all the votes in the cooperative treatments, each vendor was expected to get a vote in the competitive treatment, and two or three vendors were expected to get all the votes in the independent treatment.

4.2.2 Results Across Reward Treatments

To discern if the different reward treatments had an overall or global effect on both conflict and coalition formation, multivariate analysis of variance (MANOVA) was run with both measures as

criterion variables. Winer (1971, p. 232) indicates, "the simultaneous response of the experimental units to all variables, considered as a single response, generally contains more information about the total effect of the treatment than does the series of responses considered singly." Two such MANOVA analyses were performed, one on conflict and coalitions using the Norton measure, and the other on conflict and coalitions using the Vote measure. The results are summarized in Tables 4.8 and 4.9, and were significant in both cases. The values for Wilks' lambda (used in accord with Hair, et al., 1979, p. 148) were .001 in the case of conflict and the Norton measure, and .085 in the case of conflict and the Vote measure. The fact that both were significant at the .001 level is supportive of the hypothesis that the differences between the reward treatment centroids or mean vectors are real. As Cooley and Lohnes (1971, p. 224) summarize, "the research issues concern whether some or all of the populations are centered at different locations in the measurement space spanned by the dependent vector variable." It should be noted that Tables 4.8 and 4.9 are presented in accordance with the format suggested by Tatsuoka (1971).

In a separate analysis, using Pearson's correlation, significant correlation coefficients were found between perceived conflict and both the Norton coalition measure ($r = .33$, $p \leq .01$) and the Vote coalition measure ($r = .36$, $p \leq .01$). This indicates that these are not completely unrelated variables, which was also suggested in Section 2.4.1. Specifically, in the discussion of the conceptual

TABLE 4.8

Summary Table: MANOVA for the Effects of
Reward Treatments on both Perceived Conflict
and Coalition Formation (using the Norton measure)

dependent variables: perceived conflict
Norton

Source	SSCP Matrix	d.f.	Se	Lambda	Approx. F	Signi- ficance
Treatment Effect	$\begin{bmatrix} 2185.6 & \\ 118.0 & 25.2 \end{bmatrix}$	2	$\begin{bmatrix} 2668.6 & \\ 121.1 & 50.8 \end{bmatrix} = 120899.6$	.102	43.6	$\leq .001$
Error	$\begin{bmatrix} 483.0 & \\ 3.11 & 25.6 \end{bmatrix}$	42	$\begin{bmatrix} 483.0 & \\ 3.11 & 25.6 \end{bmatrix} = 12355.1$			

TABLE 4.9

Summary Table: MANOVA for the Effects of Reward
Treatments on both Perceived Conflict
and Coalition Formation (using the vote measure)

dependent variables: perceived conflict
vote

Source	SSCP Matrix	d.f.	Se	Lambda	Approx. F	Signi- ficance
Treatment Effect	$\begin{bmatrix} 2185.6 & \\ 116.7 & 25.2 \end{bmatrix}$	2	$\begin{bmatrix} 2668.6 & \\ 120.2 & 42.8 \end{bmatrix} = 99768$	.085	49.78	$\leq .001$
Error	$\begin{bmatrix} 483.0 & \\ 3.5 & 17.6 \end{bmatrix}$	42	$\begin{bmatrix} 483.0 & \\ 3.5 & 17.6 \end{bmatrix} = 8488$			

model developed for this research, it was recognized that the presence of conflict might encourage coalitions, and that coalitions, once formed, might enhance conflict. They were conceptualized and measured, though, as coacting variables dependent primarily on the reward system. Support for a significant correlation between these variables can be found in Walton and Dutton (1969), Kahan (1976), and Hinckley (1979).

Multivariate analysis of variance was also run using the two coalition measures as criterion variables, to determine if, as expected, the treatments had a global effect on coalition formation. The result was a treatment effect (Wilks' $\lambda = .225$) significant at the .001 level (approximation of $F = 22.71$). Table 4.10 is a summary of these findings.

Given the significant MANOVA findings for the effects of rewards on conflict and coalitions, as well as on both measures of coalitions, each of the dependent measures was analyzed individually. To ascertain the effect of the reward treatments on perceived conflict, repeated measure ANOVA (BMDP, 1975) was run using the mean scores presented in Table 4.6. This was a method of identifying significant differences among treatments over decision trials; where decision trials represented three repeated measures within each treatment. The use of ANOVA for each dependent variable following MANOVA is supported by Spector (1977). The results summarized in Table 4.11 indicate a significant main effect of reward treatments ($F=70$, d.f.=2, $p<.001$) and no significant effect on the part of the repeated decision measures within each treatment ($F = .016$, d.f. = 2, $p = .984$),

TABLE 4.10

Summary Table: MANOVA for the Effects of Reward
Treatments on Coalitions using both the
Norton Coalition Measure and the
Vote Coalition Measure

Source	SSCP Matrix	d.f.	Se	lambda	Approx. F	Signi- ficance	
Treatment Effect	$\begin{bmatrix} 25.2 & \\ -12.6 & 25.2 \end{bmatrix}$	2	$\begin{vmatrix} 50.8 & \\ -13.2 & 42.8 \end{vmatrix}$	=2000.0	.225	22.7	$\leq .001$
Error	$\begin{bmatrix} 25.6 & \\ -.6 & 17.6 \end{bmatrix}$	42	$\begin{vmatrix} 25.6 & \\ -.6 & 17.6 \end{vmatrix}$	= 450.2			

Table 4.11
 Summary Table: Repeated Measures ANOVA for the
 Effect of Reward Treatments on Perceived Conflict

Source	d.f.	SS	MS	F	Significance
Total Between Groups	14	2372.03			
Groups	2	2186.28	1093.14	70.62	$\leq .001$
Error (B)	12	185.75	15.48		
Total Within Groups	30	295.87			
Trials	2	.23	.11	.016	$\leq .984$
Trials x Groups	4	127.08	31.77	4.52	$\leq .007$
Error (W)	24	168.56	7.02		

which is consistent with the expectations. This is because there was no reason to expect that the decisions themselves would have a significant effect on conflict. They were designed to be as similar as possible. Further, the reward system was verbally explained in detail together with a written description of how points could be earned. Thus, it was not expected that learning over decisions would be an important factor. There was a significant interaction effect ($F = 4.52$, $d.f. = 4$, $p = .007$) between treatments and decisions. This suggests that, while the decisions or repeated measures themselves had no significant effect on differences between treatments, the trend across trials was different depending on the treatment. The presence of a significant interaction effect creates a need to qualify any interpretation of tests of main effects (Kirk, 1968; Winer, 1971; Keppel, 1982).

The main and interaction effects are demonstrated graphically in Figure 4.6. The relative flatness of the three relationships represented there suggests no effect by the repeated decisions, while the horizontal differences between the lines represents the treatment main effect (Kirk, 1968). The downward divergence in the cooperative treatment from the second to the third decision, while the other two treatments demonstrate increases in conflict, is a likely explanation of the significant interaction effect between treatments and decisions. Keppel (1982) refers to this as an ordinal interaction, where the relative ranking of the levels of conflict do not change over the different reward treatments. He concludes

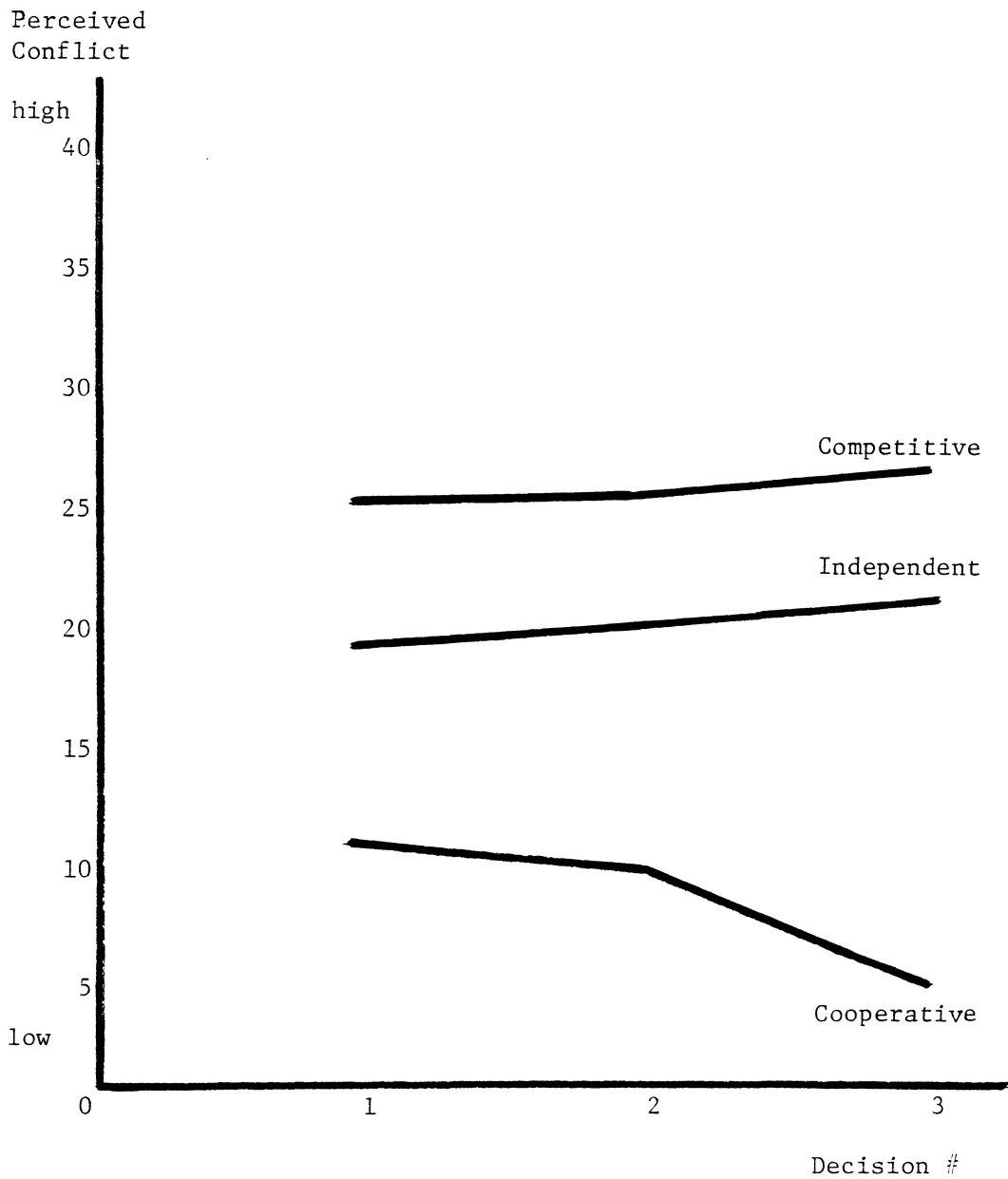


Figure 4.6 Average Level of Perceived Conflict for Each Decision, by Treatment (scale is reversed)

(1982, p. 211) that the main effect can, in fact, be interpreted as a main effect in the presence of such ordinal interaction, while no general conclusions could have been reached concerning the effect of conflict had the interaction been disordinal. A possible interpretation is that, while conflict is relatively low under a cooperative reward system, it declines further as subjects work to eliminate conflictful relationships over time. On the other hand, conflict is higher in an independent or a competitive reward system, and intensifies only slightly over time.

A coefficient of correlation (η^2) was calculated using the repeated measures output. This was accomplished by adding the individual sums of squares to get the total, and dividing this into the total minus the sum of squares for the within groups error term. The result is a statistic to describe the percent of the total variation in perceived conflict which was explained by the reward treatments (SPSS, 1975, p. 404). In this case, 93 percent of the variation in perceived conflict was explained, of which 82 percent was due to the reward treatments. At the same time, only 4.7 percent was explained by the interaction effect. This provides further support for the importance of the main effect. Keppel (1982) argues that F-tests involving main effects can be interpreted without qualification where the interaction is significant but relatively small.

To ascertain the effects of reward treatments and the three decision interactions on coalition formation, repeated measures ANOVA was run using the data from the Norton measure (see Table

4.7a) and, separately, the data from the Vote measure (see Table 4.7b). In terms of the Norton measure, there was a significant main effect for the treatments ($F = 9.47$, d.f. = 2, $p \leq .003$), but not for the decisions or the interactions of decisions with treatments. Table 4.12 is a summary of these results. A coefficient of correlation (η^2) was calculated, indicating that 50 percent of the variation in coalitions (using the Norton measure) was explained by the reward treatments. Similar results were found for the Vote measure. As summarized in Table 4.13, there was a significant main effect for treatments ($F = 2.29$, d.f. = 2, $p < .001$) but not for the repeated decisions or the interactions of decisions with treatments. The calculation of η^2 resulted in a finding that 58 percent of the variation in the number of vendors receiving zero votes was explained by the reward treatments. These results provide strong support for the overall hypothesis that coalition formation is significantly affected by the types of rewards offered to individuals.

Figure 4.7 is a graphical illustration of the number of coalitions which formed on each decision in each treatment using the Norton measure. As can be seen, the relationships are relatively flat, indicating no significant effect due to the repeated decision measures. The parallel distance between them suggests a significant treatment effect. The trend across decisions is sufficiently consistent between treatments as to negate any interaction effect between treatments and decisions. Similar inferences can be drawn for the

TABLE 4.12

Summary Table: Repeated Measures ANOVA for
the Effect of Reward Treatments on Coalitions
Using Norton Measure

Source	D.F.	SS	MS	F	Significance
Total Between Groups	14	30.57			
Groups	2	24.84	12.42	9.47	$\leq .003$
Error (B)	12	15.73	1.31		
Total Within Groups	30	10.00			
Trials	2	.31	.16	.50	$\leq .613$
Trials X Groups	4	2.22	.56	1.78	$\leq .165$
Error (W)	24	7.47	.31		

TABLE 4.13

Summary Table: Repeated Measures ANOVA for the
Effect of Reward Treatments on Coalitions Using
Vote Measure

Source	D.F.	SS	MS	F	Significance
Total Between Groups	14	31.24			
Groups	2	24.84	12.42	23.29	$\leq .001$
Error (B)	12	6.40	.53		
Total Within Groups	30	11.99			
Trials	2	.31	.16	4.24	$\leq .659$
Trials X Groups	4	2.88	.72	1.97	$\leq .131$
Error (W)	24	8.80	.37		

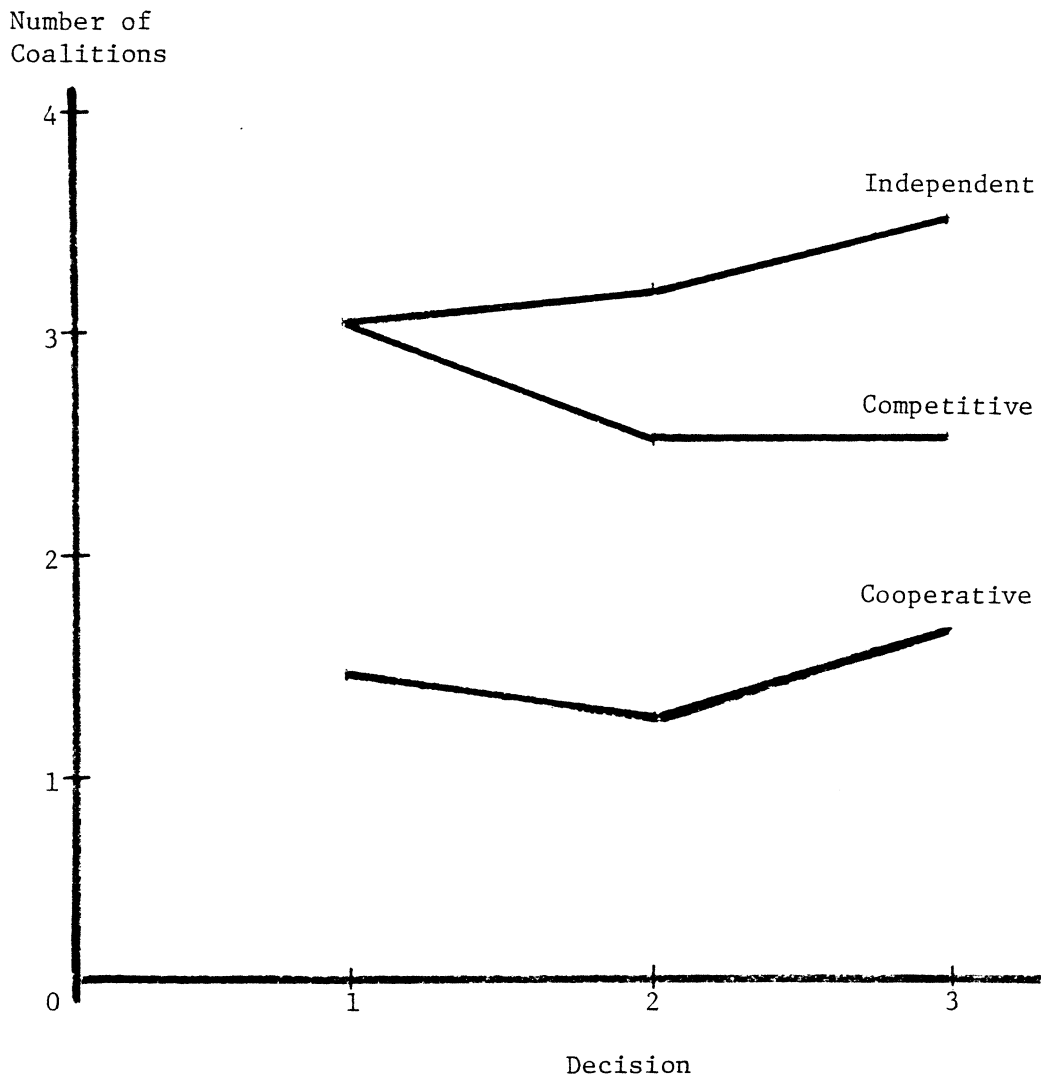


Figure 4.7 Average Level of Coalition Formation for Each Decision, by Treatment (Norton Coalition Measure)

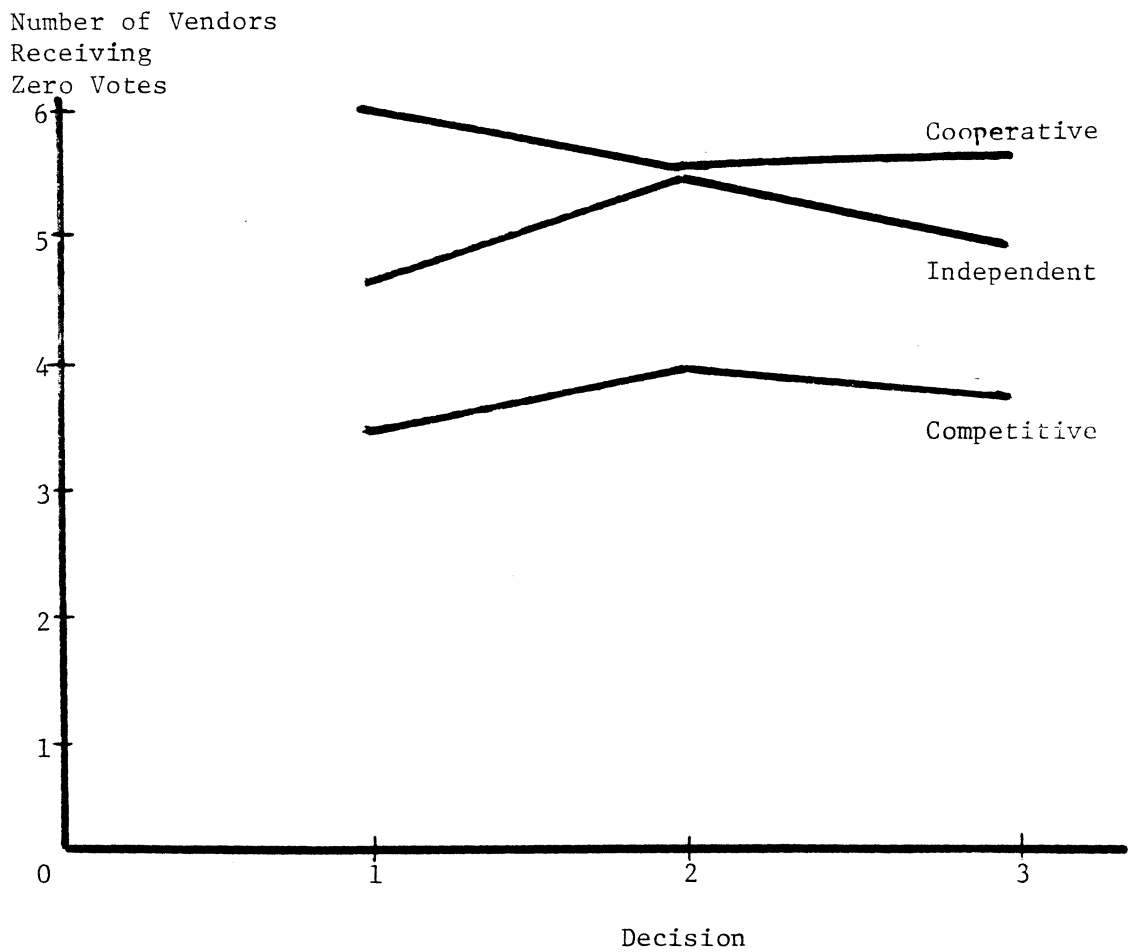


Figure 4.8:
Average Level of Coalition Formation for Each Decision, by
Treatment (Vote Measure)

Vote measure from Figure 4.8. The relationships are relatively flat, suggesting little effect due to decisions, while the parallel distance between them represents the significant treatment effect. In terms of trend, the cooperative treatment demonstrates a different pattern across decisions than the competitive or independent treatments, but apparently not enough to create a significant interaction effect. In comparing Figures 4.7 and 4.8, it appears that the Norton measure is better able to discriminate among all three treatments, while the Vote measure differentiates the competitive treatment from the others. In each case, by the third decision the differences between treatments are distinct.

Separately, oneway ANOVA was run to determine if significant differences existed for conflict and each measure of coalition formation among decisions within each treatment, among buying centers within each treatment, and among treatments. The results support the repeated measures analysis described above. For the most part, the only significant effects were due to treatments, while differences across decisions and across buying centers were largely inconsequential. This suggests that neither perceived conflict, nor coalition formation, were seriously effected by any learning effects or by random differences in the characteristics of group members. The only exception concerning learning is for the effect of rewards on conflict between the second and third decision in the cooperative treatment (see Figure 4.6), which was discussed earlier. The only exceptions concerning buying center differences were significant

differences in coalition formation under the cooperative ($F = 3.5$, d.f. = 4, $p \leq .05$) and competitive ($F = 6.2$, d.f. = 4, $p \leq .01$) treatments using the Norton measure. Summary data from these 21 analyses are found in Table 4.14. Where significant differences existed, a posteriori contrasts were run. The results are elaborated upon in the following three sections.

Both conflict and coalition formation were also averaged across decisions for each buying center (see Tables 4.6, 4.7a and 4.7b) resulting in five observations (averages) per treatment for each measure. Oneway ANOVA was run, resulting in a finding of significant differences in conflict across treatments ($F = 70.3$, d.f. = 2, $p \leq .001$), significant differences in coalitions using the Norton measure across treatments ($F = 9.7$, d.f. = 2, $p \leq .01$) and significant differences in coalitions using the Vote across treatments ($F = 23.37$, d.f. = 2, $p \leq .001$). The findings are included in Table 4.14.

La Tour and Miniard (1983) have criticized the failure in marketing research studies of this sort to report information concerning verification of the ANOVA assumption of homogeneity of variance. In testing for this assumption on the perceived conflict data, it was not violated in terms of differences over decisions or differences over buying centers, based on the Bartlett-Box F tests (SPSS, 1975). It was violated, however, in terms of the ANOVA performed on differences between treatments ($F = 4.49$, $p = .001$). This may be due to a tendency on the part of those in the cooperative treatment

Table 4.14: Summary Table of Oneway ANOVA's
on Dependent Variables (Conflict and Coalition Formation)
across Buying Decisions, Buying Centers, and Treatments

Variables	df	SS _B	SS _W	F	Signifi- cance
Perceived Conflict:					
across decisions, cooperative treatment	2,12	84.4	168.3	3.0	.09
across decisions, competitive treatment	2,12	5.4	40.9	0.8	.47
across decisions, independent treatment	2,12	37.7	146.2	1.5	.25
across buying centers, cooperative tmt.	4,10	111.9	140.8	2.0	.17
across buying centers, competitive tmt.	4,10	13.6	32.8	1.0	.44
across buying centers, independent tmt.	4,10	60.9	122.9	1.2	.36
across reward treatments	2,42	2185.6	483.0	95.0	<.001
Coalitions (Using Norton Measure):					
across decisions, cooperative treatment	2,12	0.4	9.2	0.3	.77
across decisions, competitive treatment	2,12	1.2	10.4	0.7	.52
across decisions, independent treatment	2,12	0.4	4.0	0.6	.56
across buying centers, cooperative tmt.	4,10	5.6	4.0	3.5	.05
across buying centers, competitive tmt.	4,10	8.3	3.3	6.2	.01
across buying centers, independent tmt.	4,10	1.7	2.7	1.6	.24
across reward treatments	2,42	25.2	25.6	20.7	<.001
Coalitions (Using Vote Measure):					
across decisions, cooperative treatment	2,12	1.7	4.0	2.6	.12
across decisions, competitive treatment	2,12	0.5	8.4	0.4	.69
across decisions, independent treatment	2,12	0.9	2.8	2.0	.18
across buying centers, cooperative tmt.	4,10	1.7	4.0	1.1	.42
across buying centers, competitive tmt.	4,10	3.6	5.3	1.7	.23
across buying centers, independent tmt.	4,10	1.1	2.7	1.0	.45
across reward treatments	2,42	25.2	17.6	30.1	<.001
Perceived Conflict (averaged over decisions):					
across reward treatments	2,12	728.5	62.2	70.3	<.001
Coalition Formation (Norton Measure-averaged over decisions):					
across reward treatments	2,12	8.4	5.2	9.7	.003
Coalition Formation (Vote Measure-averaged over decisions):					
across reward treatments	2,12	8.3	2.1	23.4	<.001

(Note: tmt. = Treatment)

to understand and adjust their behavior to the reward system more quickly than when conflict is evidenced. That is, they reached an asymptotic or equilibrium level more quickly. Subsequently, they were able to reduce the already low level of perceived conflict while tending to form grand coalitions. Kirk (1968) argues that the F distribution is robust with respect to violations of the homogeneity assumption so long as the number of observations in the samples is equal, which was the case here. At the same time, La Tour and Miniard (1983) indicate that violation of the assumption may increase the likelihood of a Type I error. An attempt was also made to determine if the assumption was violated in the case of the coalition formation data. It was not violated for the analysis of differences between decisions within each treatment, or for the analysis of differences between buying centers within each treatment, using both the Norton and Vote measures. Similarly, the F-test for differences in variance between treatments was not significant, indicating sufficiently homogeneous variance for the data generated by both the Norton ($F = 1.612$, $p \leq .20$) and Vote ($F = 2.007$, $p \leq .15$) measures.

Having found that an examination of the directionality of the data demonstrated its consistency with the research hypotheses, and that the results for MANOVA, the repeated measures ANOVA, and oneway ANOVA identified a treatment effect which is both statistically significant and large, tests for individual hypotheses were run. These were discussed as they apply to each of the three reward

treatments.

4.2.3 Results for the Cooperative Reward System

H_{1a} : A cooperative reward system will result in low levels of perceived conflict in the buying center relative to independent or competitive reward systems.

H_{1b} : A cooperative reward system will result in low levels of coalition formation in the buying center relative to that found under an independent reward system, and approximately equal to that found under a competitive reward system

The hypotheses concerning perceived conflict and coalition formation under the purely cooperative reward system received stronger support than any of the other hypotheses. Using a summated score for Hemphill's visciduity measure, where zero represents extensive conflict and fifty represents very little conflict, the mean level of perceived conflict in the cooperative treatment was 41.8. This total is higher (i.e., conflict is lower) than that found in either of the other treatments. To verify that these differences were significant, a posteriori contrasts were used to isolate differences between pairs of treatment means. These contrasts were also used to isolate any significant differences among means of decisions or buying centers within each treatment. Fisher's Least Significant Differences (LSD) test and the Scheffe test were run at the .05 level. Of the comparison tests available, the former was the most power to detect real differences among means, while the latter is the most conservative (Kirk, 1968, p. 95). This analysis resulted

in two key findings. First, perceived conflict went down significantly between the second and third decisions within the cooperative treatment (see Figure 4.3), lending support to the earlier explanation of the interaction effect in the repeated measures ANOVA. Second, the cooperative treatment differed significantly from both of the other treatments in terms of perceived conflict, and the direction of these differences was as hypothesized (see Figure 4.3).

The hypothesis concerning coalitions was tested in terms of the actual number of coalitions formed (Norton measure) and the number of vendors receiving no votes (Vote measure). As expected, few coalitions formed in the cooperative treatment; both absolutely and relative to the other treatments. Using the Norton sociometric measure, buying centers averaged 1.4 coalitions per decision. For the voting measure, the mean number of vendors receiving no votes from a buying center in a given decision was 5.5, out of a possible 6.0. The finding that a number of coalitions formed on the very first decision made by each buying center in the cooperative treatment supports the contention that cooperative reward systems lead to more coordination, better communication, and a greater tendency for incorporation of the attitude of the generalized other by group members (e.g., Zander, 1949).

The *a posteriori* contrasts (both Fisher's LSD and Scheffe) on the data from the Norton measure and from the Vote measure demonstrated significant differences between the cooperative treatment and each of the others at the .05 level. Specifically, the

cooperative treatment resulted in significantly fewer coalitions using the Norton measure, and significantly more vendors receiving no votes, than either of the other two treatments. The fact that the cooperative and competitive treatments differed in terms of the Norton measure is due more to a failure of the competitive treatment to have the hypothesized effect, as will be elaborated upon in the following section. In terms of the Vote measure, these results are highly supportive of the hypothesized vote distribution presented in Table 3.2. It was expected that grand coalitions, where group members reach a unanimous consensus, would be likely to occur in the cooperative treatment. This was, in fact, the result in nine out of fifteen decisions.

4.2.4 Results for the Competitive Treatment

H_{2a} : A competitive reward system will result in high levels of perceived conflict in the buying center relative to cooperative or independent systems.

H_{2b} : A competitive reward situation will result in low levels of coalition formation in the buying center relative to that found under an independent reward system, and approximately equal with that found under a cooperative reward system.

The results for the impact of the competitive reward system represented some departure from the hypotheses. The a posteriori contrasts indicated that the level of perceived conflict was significantly higher than in either of the other treatments, with a mean value of 25.05 per decision across the buying centers. This was

as hypothesized. However, there was more coalitional activity than expected. Using the Norton measure, buying centers averaged 2.6 coalitions per decision under the competitive reward, which is a level in between that found in the other two treatments. It was hypothesized that significant differences would exist in the number of coalitions between the competitive and independent treatments, but not between the competitive and cooperative treatments. Some of the evidence suggested the opposite to be the case. The a posteriori contrasts on the data from the Norton measure produced mixed results at the .05 level. While Fisher's LSD procedure indicated all three treatments differed significantly from one another, no significant differences were found between the competitive and independent treatments using the Scheffe procedure. The Scheffe method is more conservative with regard to the risk of a Type I error (Winer, 1971, p. 201).

Both procedures identified significant differences between the competitive treatment and each of the others for the data provided by the Vote measure. Specifically, an average of 3.73 vendors received no votes in buying centers reacting to a competitive reward system. This is significantly lower than either of the other two treatments, as hypothesized. The fact that even fewer vendors did not receive zero votes in the competitive treatment, as had been expected, may explain the higher than expected number of coalitions in that treatment identified with the Norton measure. In this sense, the two measures support one another.

The hypothesis concerning coalitions was based on an expectation of deadlocks in the competitive treatment, and thus few coalitions. The zero-sum game scenario apparently encouraged a limited level of cooperation, though, rather than complete deadlocks. In fact, out of the total of fifteen decisions made under this reward system, only six resulted in deadlocks where no vendor was selected. An explanation for this might be found in Zander (1977), who argues that it is a natural tendency for members of a group to compromise their own needs to some degree for the sake of the group. Further, the non-significant differences between the competitive and independent reward treatments using the Norton measure might be a result of the strong competitive motives that arose under the independent reward. An implication might be that even more extreme levels of competition and conflict are necessary to discourage coalitions over deadlocks.

4.2.5 Results for the Independent Reward System

H_{3a} : An independent reward system will result in a moderate level of perceived conflict in the buying center relative to cooperative and competitive systems.

H_{3b} : An independent reward situation will result in extensive coalition formation relative to that found under either cooperative or competitive reward systems.

The results for the independent treatment largely confirmed the hypotheses. A level of conflict resulted which was intermediate between the cooperative and competitive treatments. The mean level

of perceived conflict in the independent treatment was 30.58, which the a posteriori contrasts identified as significantly different than that found under the other treatments.

More coalitions formed as a function of this reward system than either of the others, confirming the link between the mixed-motive reward and the mixed-motive behavioral response. An average of 3.2 coalitions formed in each buying center for each purchasing decision, using the Norton measure. This is significantly higher than that found in the cooperative treatment according to both Fisher's LSD and the Scheffe procedure. However, only the Fisher procedure identified any significant differences between the independent and competitive treatments. This inconsistency was addressed in the preceding section, and would appear to be related more to a failure of the competitive treatment (rather than the independent treatment) to have the hypothesized effect. Significant differences were uncovered between the independent treatment and the other two using the Vote measure. The mean level of vendors receiving no votes was 4.8, which represents a level intermediate between the competitive and cooperative treatments, as expected (see Table 3.2).

A noteworthy aspect of the independent reward system was the tendency for somewhat stronger competitive motives than cooperative motives. While conceptualized as a combination of both motives, it appears that subjects responded more to the competitive than the cooperative dimension. Such a likelihood is supported by Rosenbaum, et al (1980) and by Dawes (1980). In their view, such an

Table 4.15: Results for a Posteriori
Contrasts Used in a Hypothesis Testing

<u>Sheffe Procedure (.05 level)</u>			
	<u>Competitive vs. Cooperative Treatment</u>	<u>Competitive vs. Independent Treatment</u>	<u>Cooperative vs. Independent Treatment</u>
1) Perceived Conflict	s.d.*	s.d.*	s.d.*
2) Coalition Formation (Using Norton Measure)	s.d.	n.s.d.	s.d.*
3) Coalition Formation (Using Vote Measure)	s.d.*	s.d.*	s.d.*

Fisher's Least Significant Differences Procedure (.05 level)

	<u>Competitive vs. Cooperative Treatment</u>	<u>Competitive vs. Independent Treatment</u>	<u>Cooperative vs. Independent Treatment</u>
1) Perceived Conflict	s.d.*	s.d.*	s.d.*
2) Coalition Formation (using Norton Measure)	s.d.	s.d.*	s.d.*
3) Coalition Formation (Using Vote Measure)	s.d.*	s.d.*	s.d.*

KEY: s.d. = Significant differences were found
n.s.d. = Non-significant differences were found
* = Results which are supportive of hypotheses

occurrence is a function of how much group members view the mixed motive scenario as a condition where goal attainment by any one member is negatively correlated with goal attainment by others.

4.2.6 Summary of Hypotheses

The research hypotheses were largely supported. Increases in perceived conflict accompanied a move from rewards encouraging pure cooperation to rewards encouraging pure competition. Coalition formation appears to be most likely under independent or mixed-motive reward systems where perceptions of conflict are moderately high. As one moves away from an environment encouraging pure cooperation, coalition formation increases. Once introduced, competitive motives tend to dominate cooperative motives, and conflict increases substantially. Coalitions remain a likelihood even as competition prevails over cooperation. However, there appears to be a level at which additional increases in the competitive motive reduce the incentive for coalition formation. The contrasts used in hypothesis testing are summarized in Table 4.15.

4.3 POWER, EFFECT SIZE, AND STATISTICAL SIGNIFICANCE

It might appear that power, the probability of correctly rejecting the null hypothesis, would not be of concern here, given the significant findings. Sawyer and Ball (1981), in noting the high statistical power in much of the recently published research in marketing, encourage the calculation and reporting of power in all cases. Further, this research is exploratory, and will hopefully lay the ground work for future efforts. As such, it may provide

a useful benchmark for further research in terms of power and effect size. In fact, Cohen (1977) explains that the a priori estimation of power requires an estimation of expected effect size, typically based on previous research findings.

Power is often estimated in the planning stages, especially in determining the sample size needed to obtain a specific power level. The sample size in this experiment was constrained by the complexity of the procedure, and the need to obtain group level data in a reasonable time frame. While 105 subjects participated, these were placed into fifteen buying centers, each of which made three decisions.

Cohen (1977) also provides a method for post hoc estimation of power. He provides for the estimation of power when one is conducting oneway analysis of variance with sample sizes equal in each treatment. The calculation rests upon the number of treatments (degrees of freedom in the numerator of the F-ratio), the sample size, the significance level used, and the effect size.

There were two degrees of freedom in the numerator, given the three treatments. The sample size was fifteen per treatment as discussed above. The level of statistical significance used was .05. This is a function of a number of considerations (Labovitz, 1968). The exploratory nature of the research, the plausibility of the hypotheses, the small sample size, the relatively non-critical practical consequences of a Type I error, and the robustness of the F-test are all arguments for a large error rate. The large

effect size, the degree of confidence expressed in the direction of the hypotheses (one-tail vs. two-tail), and the relative control provided for in this experiment suggest the need for a smaller error rate. On balance, it was felt that a stronger case can be made for a large error rate (i.e., .05), based on the factors cited above. In this research, actual levels of a significance are reported where available.

There are a number of ways to calculate effect size (Cohen, 1977; Sawyer and Ball, 1981). The one used here involves dividing the correlation ratio, η^2 , by 1.0 minus η^2 , and then taking the square root of the result. Again, η^2 is a measure of the proportion of variance in the dependent variable explained by the independent variable, and is analogous to R^2 in linear regression (SPSS, 1975). It is thus referred to as a PV measure (Cohen, 1977; Sawyer and Ball, 1981). The results for this research were extremely high effect sizes for perceived conflict (3.65), coalitions using the Norton measure (2.38), and coalitions using the Vote measure (1.94).

Power can be calculated using these inputs by consulting tables provided in Cohen (1977). In this analysis, power to detect main effects exceeds 98% for each of the dependent measures. This represents the power of the oneway ANOVA test using the η^2 values from the repeated measures analysis. The repeated measures analysis is actually more powerful than the oneway ANOVA, because it partitions out variance due to the repeated decisions (learning). One

implication of these findings might be that future research be directed not just at tests concerning whether the effect of rewards is different from zero, but rather whether it is at least as large as some minimum value (Sawyer and Ball, 1981).

Chapter 5

CONCLUSIONS

5.1 DISCUSSION

The importance of cooperation versus competition in purchase decision-making rests in the conjunctive nature of the organizational buying task. Functional interdependence is a fundamental characteristic of many modified rebuy and new task purchasing processes. That is, a division of labor exists where inputs from a number of functional areas in the firm are often required. When the interdependencies between purchasing and non-purchasing departments are sufficiently great, the implications of cooperation and competition for both the decision-making process and the quality of final decisions become especially important.

Where task interdependencies exist within a group, it has been argued that a cooperative orientation (versus a competitive orientation) will tend to result in more coordination, division of labor, diversity in the amount of each member's contribution, productivity, effective communication, appreciation for the needs of others, and positive feelings about the group (Deutsch, 1949; Miller and Hamblin, 1963; Scott and Cherrington, 1974; Okun and Divesta, 1975; Rosenbaum, et al., 1980). The reward system is instrumental in determining the degree to which a group member will pursue individual versus collective interests (Olson, 1980). Marwell and Schmitt (1975, p. 7) make the key point that "rewards of sufficient size and frequency are requisite for the maintenance of most behaviors, including

cooperation." The results of this research support this position. The tendency of group members to behave cooperatively or to pursue a more competitive, individualistic strategy was very much affected by the manner in which they were rewarded.

Cooperation is the result not just of the magnitude and schedule of rewards, but how one perceives his/her reward in relation to that of others in the group (Adams, 1965). A purely cooperative reward system, such as the one used in this research, creates a situation where reward differentials do not exist. Rather, people are all receiving the same reward, but its magnitude varies with their collective efforts. Moreover, under such a reward system, the interpersonal risks inherent in cooperation are lessened. Cooperating can make one dependent on others for successful task performance as well as for obtaining rewards, and may require the pooling or exchanging of one's own resources. Such dependency and sharing of resources may be perceived as risky, but these risks may be compensated for with a properly designed reward system such as the one used here (Marwell and Schmitt, 1975).

This research has demonstrated the tendency for purely cooperative reward systems to result in relatively low levels of perceived conflict within simulated buying centers. Moreover, such a reward system has been shown to lead to the formation of grand coalitions within such groups. Of course, it should be kept in mind that such a reward system is an "ideal-type" located at the extreme end of the cooperative-competitive continuum. As such, it is not typically

found in an interdepartmental context within business organizations. For example, some departments, such as purchasing, may be rewarded for considering and supporting the needs of others (Corey, 1978a). At the same time, other departments may be concerned only with parochial interests, in that they do not perceive their rewards to be dependent upon cooperation with others. While most organizations do not demand total cooperation among departments, they often build specific incentives for cooperation into the compensation system (Hamner and Organ, 1978). As a result, one must consider the implications of other reward systems. This research does provide guidance, however, in terms of the likely effects on perceived conflict and coalition formation of efforts to create increasingly cooperative environments through the organizational reward system.

The purely competitive reward system lies at the other end of the continuum, creating a zero-sum game in which one person's gains come at the expense of others. Deutsch (1949) has demonstrated the potentially deleterious effects of competition on group process and performance where task-interdependency exists. However, a heavy emphasis on competition among departments is often a managerial reality. Hamner and Organ (1978, p. 205) find that "many business organizations seem to be based on the premise that competition is not necessarily an evil that should be minimized but a positive force that should be maximized." They argue that competition means that many individuals will lose, often repeatedly, and that winning often entails a high (and difficult to measure) cost. Additionally,

competitive situations may give rise to attitudes of rivalry, where one seeks not only to do well in the competition, but also to defeat others (Thibaut and Kelley, 1959). Rivalry may, in turn, beget more rivalry. Levine and Campbell (1972) refer to a natural progression from perceived competition to conflict and then to perceived hostility which they label "ethnocentrism."

In a purchasing context, competition between departments may discourage complacency and give rise to the consideration of more and better sources of information and supply. However, an over-emphasis on competition may be dysfunctional. In an effort to enhance one's competitive position, nonrational or inefficient tactics such as rule-evading and political ploys discussed by Strauss (1962) may be relied upon. Moreover, highly competitive scenarios are likely to be characterized by extensive conflict (Pondy, 1969; Walton and Dutton, 1969; Walton, Dutton and Cafferty, 1969). For example, Sheth (1973) argues that conflict in industrial buying can lead to politicking and back-stabbing tactics.

The results of this dissertation support the notion that relatively high levels of perceived conflict will result under a highly competitive reward system. In addition, a tendency was found for deadlocks to form in decision-making, and for some coalitions to emerge. In many cases, the buying center discussion appeared to degenerate into a largely political process in which subjects were less likely to listen to one another and were highly critical of one another's positions. Moreover, often these groups used the

entire allotted time without reaching a decision. Indeed, some subjects included unsolicited written comments concerning their dissatisfaction with the reward system in these groups. Those subjects that did coalesce when facing a competitive reward may have done so for a number of reasons, including a desire on their part to have their vote count for something (to avoid a complete deadlock), an expectation that the favor would be returned on future decisions, or a desire to defeat some third party with whom they disagreed even more. The relatively few coalitions that formed support the proposition that people will pursue their individual (mutually exclusive) interests at the expense of group or organizational needs if they are rewarded for doing so (Olson, 1965; Marwell and Schmitt, 1975; Kerr, 1975; Oliver, 1980).

In fact, it is difficult to discern any evidence that organizational purchasing needs or objectives were an over-riding concern of those subjects who were exposed to the purely competitive reward treatment. Yet, as observed by Litterer (1966), management frequently designs reward systems which create win-lose competitive situations without recognizing that they have done so. An example within the buying center would be a reward system that measured the purchasing department solely on cost savings to the firm while measuring engineers solely on the quality of the products they design. The competitive reward system, like its purely cooperative counterpart, represents a benchmark or reference point at one end of the continuum. This research provides evidence of what can be expected

in terms of perceived conflict and coalition formation as reward systems approach that benchmark.

Finally, the independent or mixed-motive reward system lies closer to the middle of the cooperative-competitive continuum. It would appear that most organizational reward systems include elements of both cooperation and competition. Thus, the independent reward system used in this research may be closer to the actual situation found in many business firms. For example, many departments involved in purchasing share common interests and concerns, and some are directly dependent upon one another. In most organizations, marketers will share the engineer's concern for product quality and the purchasing agent's concern for cost. Purchasing managers share the preoccupation of those in production with the reliability of delivery and are dependent upon the blueprints and/or specifications of the engineer. The ability of any person in these various departments to earn rewards may be a function of how much they consider the concerns of others. Corey (1978a) provides an example of purchasing departments evaluated on criteria such as facilitating user needs (e.g., production), maintaining rapport with engineering, and negotiating acceptable prices.

At the same time, it may be unlikely that any given departmental representative will find that his/her rewards correlate with the collective interests of the entire buying center. The individual may have no specific incentive to consider overall group needs and thus may approach the group only as a means of achieving individual

rewards (Rosenbaum, et al., 1980). This research has demonstrated that, to the extent a mixed-motive scenario is created through the reward system, both conflict and coalitions are likely.

The divergent goals of subsystems or departments may lead them to engage in a kind of rationality which leads to considerable goal suboptimization (Cyert and March, 1962; Lawrence and Lorsch, 1967). Where subsystems are interdependent (as in major purchase decisions), some sort of negotiation process is necessary to reconcile conflicting goals. Cyert and March (1963) suggest that coalitions will emerge and that only a quasi-resolution of conflict takes place. That is, conflict is resolved only in part, and latent conflict continues to persist. The major finding of this dissertation is that the amount of competition built into a reward system is instrumental in explaining the amount of coalition formation that results. Moreover, it appears that competitive motives will tend to dominate cooperative motives when both are present. This represents an extension of earlier research, which demonstrated that the types of coalitions which form are influenced by the size and distribution of rewards (Gamson, 1961; Komorita and Chertkoff, 1973; Komorita, 1974; Lawler and Youngs, 1975; Folkes and Weiner, 1977; Chertkoff and Esser, 1977; Hinckley, 1979; Komorita, Sweeney and Kravitz, 1980; Komorita and Tumonis, 1980; Miller, 1980; Kravitz, 1981). Further, the results tend to support the predictions of the Anderson (1981) reward/measurement model of buyer behavior.

5.2 MANAGERIAL IMPLICATIONS

This research has attempted to demonstrate the likelihood of coalitions in organizational buying decisions. While no empirical evidence currently exists concerning the extent of coalition formation in real world buying centers, an important antecedent for their formation has been identified: the organization reward and measurement system. The results suggest that coalitions become more likely as reward systems approach the independent or mixed-motive scenario. Further, it is suggested that some variation of the mixed-motive reward system is found in many industrial organizations. To the extent that this is the case, it raises a number of issues for managers of both selling and buying organizations. These are summarized in Tables 5.1 and 5.2.

5.2.1 Industrial Selling

A critical challenge facing the industrial salesperson is the identification of key sources of power and influence for a given purchase (e.g., Silk and Kalwani, 1982). The distribution of power in a major purchase decision can be explained in terms of formal and informal organizational structure. Spekman and Stern (1979) have emphasized the importance of buying group structure for determining the nature of the industrial purchasing process. They emphasize four (bureaucratic) dimensions of buying group structure: centralization, rules and procedures, division of labor, and the amount of participation in decision-making. A broader perspective is provided by Mintzberg (1979, p. 67), in which structure is conceptualized

Table 5.1: Questions With Implications
for Selling Organizations

- A. To what extent are buying center roles filled by coalitions rather than individual department representatives?;
- B. How are power and influence in industrial buying affected by the existence of coalitions among buying center members?;
- C. How might the industrial salesforce weight the relative influence of various coalitions and departments?;
- D. What special problems do coalitions pose for conducting research on industrial customers and their needs?;
- E. Can coalitions be used as a possible basis for microsegmentation?;
- F. Should product and vendor attributes be designed to reflect the mutual interests of the members of powerful coalitions?;
- G. Does the presence of coalitions create a more political environment in which salespeople must compete?;
- H. How do coalitions affect the amount and types of information sought, and the organizational processing of that information?;
- I. How stable are coalitions and the effect they have on purchase decisions over time?;
- J. Are coalitions instrumental in getting organizations to engage in more source loyalty with regard to coalition-favored sources of supply?;

as the established forces of habit, tradition, and power. Within this context, buying group structure can also be characterized by the number and size of any coalitions which exercise power and influence over the decision-making process.

Coalitions are a cooperative effort among individuals for the purpose of exercising control over others (Thibaut and Kelley, 1959). Most theories of coalitions assume competitive motives. The nature of power relationships within the buying center is altered by the emergence of a coalition. Bonoma (1982) explains that selling effectiveness is increasingly dependent upon the ability of the sales team to understand the power culture in customer firms, and to determine the source of power held or sought by key decision-makers in these firms (see also Cooley, Jackson and Ostrom, 1978). Bonoma's findings suggest that power and formal authority in buying do not necessarily go hand in hand, that there is no correlation between the functional area of an individual and his/her power, and that buying centers typically display one dominant power base. The findings of this dissertation suggest that a power base may be achieved in purchasing decisions by combining individual or departmental resources through coalitional arrangements. The salesperson, in systematically analyzing power relationships, should examine the effect of coalition formation among buying center members. Just as Bonoma (1982) stresses the power base of individuals, so too should the power base of coalitions be emphasized.

The more detailed an understanding the sales manager has of

the power distribution within the buying center and the interactions resulting from this power distribution, the greater are the possibilities for developing some weighting system. Here, the relative power or influence of different individuals, departments or coalitions might be represented by weights. These might be used in assessing the allocation of personal sales or promotional efforts within the buying center. Choffray and Lilien (1978) have provided some direction in this respect.

The buying center concept is an attempt to address buying group structure in terms of social roles. Roles may emerge in organizational buying through differentiation, competition, conflict and negotiation among individuals and departments. However, these roles may be filled by coalitions rather than individuals. For example, two departments which ordinarily play only a minimal role in organizational buying may achieve the status of "influencer" or "decider" by coalescing. Alternatively, they may be able to determine the nature and type of information sought, as well as the flow of that information through the organization (i.e., the gatekeeper role). This contention is supported by Spekman and Stern (1979) in their findings that information gathering and processing within the buying center are significantly affected by buying group structure. Coalition formation has the effect of changing group structure.

Both market research and marketing strategy should reflect these possibilities. Market research efforts must take into consideration the attitudes, needs and behavior of coalitions, rather

than focus just on the individual purchasing agent or engineer. Marketing strategy may need to emphasize product and vendor attributes which reflect the mutual interests of the members of powerful coalitions.

Additionally, coalitions should be considered in developing a market segmentation strategy. Wind and Cardozo(1974) have proposed that industrial markets first be divided into macro-segments based on organizational characteristics such as annual sales, end-use of product, or S.I.C. group. Following this, companies should be placed into micro-segments, based on characteristics of the decision-making unit in the firm. Bases for microsegmentation might include the demographics of buying center members, innovativeness of members, time pressure felt by members, the rigidity of rules and procedures used in decision-making, the nature of reward and measurement systems, and the degree of centralization. Coalitions may represent another basis for microsegmentation. For example, a firm may segment buying centers in terms of whether or not they include coalitions, the size of coalitions, and which departments tend to coalesce. Firms may find that, within a given industry, coalitions tend to develop between purchasing and marketing, or between engineering and production.

Salespeople may find themselves in a much more political environment as a result of coalitions within customer firms. Politicking refers to a style of decision-making characterized by game playing, the exchange of favors (among allies), backstabbing, mutual dislike,

and a concern with self-interest over organizational interests (Strauss, 1962; Sheth, 1973). Vendor representatives can be caught in the middle of opposing interests. This may require that the representative be politically adept at either bridging the gap between these interests or in determining which political camp (coalition) will best serve his/her company's interests. At the same time, concentrating on a single coalition can be a perilous strategy, given the potential for coalitions to generate decisions based on a false consensus (Anderson, 1981).

Where coalitions result in only the quasi-resolution of conflict, they may be unstable over time. Moreover, different purchases may pose different kinds of problems to the buying firm (Lehmann and O'Shaughnessy, 1974), making a given coalition less attractive to a salesperson from decision to decision. Gamson (1961) explains that coalitions often are short-lived, because the members often cooperate on a single issue while agreeing to tacit neutrality on others. On the other hand, coalitions may sometimes represent longer term strategies (Chertkoff and Esser, 1977). A coalition partner may support a less-desirable position with the expectation that his/her position will be favored by the coalition in a future decision. It may be useful for the industrial seller to attempt to identify the coalitions which emerged in past purchase decisions and the reasons for their formation and dissolution.

Effective selling may also benefit from attempts to relate coalitions to source loyalty. Wind (1970) has identified a number

of variables which are significant determinants of industrial source loyalty, including interdepartmental pressures. If a coalition is successful in getting the organization to select its preferred source of supply, the coalition may make it more difficult to change to an alternative source in the future. That is, new and better sources may become available, but the coalition brings pressure for maintaining source loyalty.

5.2.2 Industrial Buying

On the buying side, it is suggested that organizations need to develop a coordinated system of rewards which reflect overall purchasing needs and objectives. Toward this end, management should ascertain the extent of conflict between the objectives of various departments in the buying center, as well as the relationship between departmental objectives and organizational purchasing needs. Conflict may also arise due to disagreement over departmental roles in the buying process (Anderson, 1981). In fact, Gorman (1971) found extensive conflict between purchasing and other functional area managers over the role of the purchasing department. The critical questions, however, concern the behavioral strategies relied upon for conflict resolution in the buying center, and how management intentionally or unintentionally affects those strategies. This research has focused on coalitions as a behavioral response to reward systems. Specifically, the results suggest a need for management to determine how much the reward system encourages interdepartmental cooperation or competition within the buying center. The greater

Table 5.2: Questions With Implications for
Buying Organizations

- A. In what ways are the concerns of the functional areas of the firm represented in the buying center in potential conflict with one another?;
- B. To what extent does the way in which the members of various departments are rewarded encourage a competitive strategy with regard to interpersonal relationships in the buying center ?;
- C. How much manifest conflict results as individuals in various departments strive to earn departmental rewards?;
- D. Is this a functional or dysfunctional level of conflict in terms of the firm's purchasing needs and objectives?; Is conflict sufficient to encourage politicking among buying center members?;
- E. What is the number and size of any coalitions which are being encouraged by the system of rewards and measures?;
- F. How do the levels of perceived conflict and coalition formation affect the process of final purchase decision-making?;
- G. How do the levels of perceived conflict and coalition formation affect the quality of final purchase decisions?;
- H. In what ways do coalitions affect the quality and quantity of purchasing related information sought by the organization, and the interdepartmental flow of that information?;
- I. Does the presence of coalitions encourage problemistic search, where new vendors or product alternatives are sought only when problems arise?;
- J. Are future purchase decisions affected by the levels of conflict and coalition formation in current or past purchase decisions?; Are decisions in non-purchasing areas affected?;

the competitive orientation, the greater the levels of perceived conflict and coalition formation.

Conflict is not necessarily dysfunctional from an organizational perspective (Litterer, 1966; Pondy, 1969). In a purchasing context, however, if conflict results in bargaining and politicking, irrational and inefficient purchasing decisions are the likely outcome (Sheth, 1973). Such an outcome may be more likely if coalition formation is being encouraged indirectly by the reward/measurement system (Bagozzi, 1978; Anderson, 1981). The underlying problem becomes the presence of dysfunctional conflict and coalition formation due to a reward system which encourages optimization at the departmental rather than the organizational level.

The presence of powerful coalitions may affect the amount, types, and sources of information sought for a given purchasing problem, and may influence the flow of that information through the organization. Additionally, once product and vendor choices are made, they may be difficult to change due to the power of certain coalitions. The result might be labeled "problemistic search," where new vendors, products, or services are sought only when significant problems arise with existing vendors, products, or services. Coalitions may also affect the length of the process. Decisions may be delayed through the use of tactics by coalition members such as those discussed by Strauss (1962). The members of a coalition may cooperate in establishing roadblocks in the decision-making process, making it impossible for any product or vendor to be chosen

unless the coalition supports that choice.

At the same time, management should be aware that coalitions can serve a useful purpose. That is, they are not inherently undesirable. A truly dominant coalition can stabilize the decision process, aid in reducing conflict, lessen perceived uncertainty, and address innate problems in widely distributed power in an organization (e.g., problems in coordination, control, competition over scarce resources, and the establishment of overall objectives). Regardless of their impact, totally eliminating coalitional ties is probably not feasible given the unequal distribution of resources in most organizations. The concern of management should center on the extent to which the reward system encourages coalitions which exist primarily to serve their own interests first, and organizational interests second.

Anderson (1981, p. 11) observes that "in facing decisions in which the demands of various buying center members are incompatible, the purchasing agent is likely to optimize those criteria most closely linked to his own rewards." Where rewards are dispensed for achievement of individual or departmental performance without regard for overall purchasing effectiveness, it becomes rational for departmental members to place themselves and their department before the organization. Kerr (1975, p. 775) explains that many organizations find themselves in the position of hoping for effort by employees toward team building, creativity, cooperation, and so forth, but formally rewarding none of these. Moreover, unless management

actively attempts to affect the buying process, coalitions may, through a system of "side payments," define and establish organizational purchasing goals. Cyert and March (1963) discuss how organizational goals can be effectively created through such side payments or exchanges made in the process of forming alliances or coalitions.

Although top management typically does not get involved in purchase decisions (Faris, 1974; Corey, 1978), it should be cognizant of its role in affecting that process. Kerr (1975, p. 782) suggests "For an organization to act upon its members, the formal reward system should positively reinforce desired behaviors, not constitute an obstacle to be overcome." Lawler (1981) discusses the role of reward systems in efforts to change organizations. He argues that by implementing policy changes through the reward system, management provides a clear indication of their commitment to policy change.

Where tasks are interdependent, Lawler (1981) stresses the need to rely on systems that reward overall or group performance rather than individual performance. Management should seek to eliminate an over-emphasis on competition in rewards affecting the buying process--especially as they approach a win-lose or zero-sum scenario. An overall reward system which places departmental goal attainment in jeopardy may serve only to increase departmental solidarity and identity, contribute to ethnocentrism, and create organizations which might be described as "collections of conflicting, competitive fiefdoms held in check by hierarchical power" (Wieland and Ullrich, 1976, p. 274).

Incentive systems can be designed to reward behavior that benefits the larger organization as opposed to behavior that is primarily in the interest of subsystems. One approach to encouraging interdepartmental cooperation in purchasing might be to make rewards a function of some superordinate goal (Sherif, 1958; Levine and Campbell, 1972). Such a goal is unattainable by any one department, and supersedes other departmental goals. The cooperative reward system used in this research might be an analogous situation. For a superordinate goal to be effective, its attainment must result in a reward with a high degree of value to buying center members. Lawrence and Lorsch (1967) have found that integrative devices are most effective when those involved in integrating (cooperating in this case) perceive that they are being rewarded for the achievement with others of a superordinate goal.

Bird and Mazze (1976) have done research which concludes that industry is not measuring and evaluating the buying function in any systematic manner. They suggest a need for interdepartmental involvement in evaluating purchasing performance. Systematic approaches for use by organizations in evaluating new vendor products have been proposed in the literature (e.g., Chenu and Wileman, 1973). Similarly, management may want to develop and apply such approaches for evaluating the inputs of each department into the buying process. A final suggestion in this vein is that management-by-objectives (MBO) programs, where they are used, should be modified to include specific purchasing objectives for each department or functional

area typically represented in the buying center.

In a separate context, Wieland and Ullrich (1976, p. 288) conclude "the problem is not to select an incentive system that will eliminate organizational conflict, but rather to decide which specific areas of conflict deserve attention and then design the incentive system accordingly." Given the large share of company resources currently claimed by purchases, buying decisions would seem to be one such area warranting attention.

5.3 RESEARCH LIMITATIONS AND FUTURE RESEARCH

The limitations of this study can be placed in two categories: those primarily related to internal validity, and those primarily affecting external validity. These two concerns are, of course, not mutually independent. Internal validity refers to the degree to which one is able to infer that a relationship between two variables is causal, while external validity refers to the degree to which one is able to generalize to and across different types of measures, persons, settings, and times (Cook and Campbell, 1979). While both should be of concern to the researcher, a trade-off sometimes exists between the control necessary for internal validity and the "realism" necessary for external validity. The relative emphasis on one versus the other is a critical design issue which hinges on the goals of the research (Cook and Campbell, 1979).

According to Calder, Phillips and Tybout (1981), these goals refer to whether one is concerned with an "effects application" or a "theory application" of the research findings. Effects

application involves a design which will provide findings that can be generalized directly to a real-world setting, while theory application requires a design that permits the measurement of effects within a context which enables the refutation of some theory (Calder, et al., 1981). In theory application, then, the goal is a rigorous test of the theory. Calder, et al. (1982, p. 240) argue that external validity is not necessary to achieve such a goal, and that it can be sacrificed in order to address threats to internal and construct validity. Fundamental to their position is the nature of the relationship between external validity and construct validity.

Construct validity refers to the degree of correspondence between unobservable constructs which exist at a conceptual level and empirical measures which exist at an operational level (Peter, 1981). Lynch (1982) indicates that external validity is a prerequisite for construct validity, and that the failure to include any background variables which might change the nature of the theoretical relationship will limit the ability to achieve either type of validity. In the extreme, this would require enumerating any and all possible background factors that might interact with treatments. Calder, et al. (1982) take the opposing view that a study could achieve construct validity but not external validity across all contexts. That is, the empirical operationalizations may be representative of theoretical concepts in a study, while the relationships between the theoretical constructs may not be generalizable across all contexts. Construct validity must be achieved to obtain

externally valid results, but the converse is not true.

As a result, scientific progress occurs by rigorously testing theory, and modifying it (e.g., through the inclusion of various background variables) as falsifications occur. Such a perspective guided this research. The goal was to test the theoretical relationship between rewards and both perceived conflict and coalition formation in groups. As such, the overriding concern was with internal validity.

The design and subsequent limitations of this study reflect such an orientation. For example, the use of a laboratory experiment provided a number of benefits. Some of these include: 1) laboratory experimentation permits the freedom to manipulate treatments without concern for the effect such manipulation would have on an actual organization; 2) it enables one to limit interaction between subjects during the treatments which might confound the effects; 3) it allows for control over both the empirical system under observation and the measurement process; 4) it is especially useful when the hypotheses of interest are explanatory rather than simple descriptive, as in this research; 5) it enables one to create the conditions required to test the hypotheses when those conditions are not readily available in natural settings.

Some of the limitations in the actual experimental design are related to issues of internal validity. The part of the procedure concerned with purchase decision-making lasted over two hours and involved three decisions. Subjects moved back and forth from their

departments to buying centers. As a result, they had approximately twenty minutes in which to pick from among seven vendors for each decision. Although vendor characteristics were fairly similar across the three decisions, more time might have been useful. However, there was a concern for respondent fatigue and cooperation if the length of the experiment were extended.

An attempt was made to design vendor attributes such that one vendor would appeal to each department. Hence, there were seven vendors and seven departments involved in each decision. Despite repeated efforts at refining these attributes in the pretests, the attraction of a given vendor to a given department was not always as intended. That is, a vendor designed to appeal to engineers may have been attractive to marketers, but not engineers. This is a limitation to the extent that less potential for conflict might have been created in some instances.

The buying problems were designed to be understandable by undergraduate business students. This is why consumer durable appliances were used and is one of the reasons why vendor descriptions were kept brief. Nonetheless, an additional limitation may be problems that individuals may have had in understanding the nature of products and component parts, the vendor descriptions, or the purchasing terms. While no tangible evidence of problems in this vein was uncovered, subjects conceivably could have encountered such problems and not communicated them.

The amount of the prize given for earning the most points may

also represent a limitation. While the manipulation checks suggested the \$25 reward was sufficiently salient, there were some people for whom this may not have been the case. The amount was sufficient, however, to demonstrate a significant main effect on the part of the reward systems.

The operationalization of the reward systems raises an additional issue. It appears that each of them had the intended effects. However, the independent reward system resulted in a relatively competitive scenario. It is difficult to be very precise concerning just how much cooperation and/or competition was actually built into a given reward system. There were no guidelines in the literature on how to manipulate the reward treatments--especially in a purchasing context. It is suggested that additional approaches to operationalizing such environments need to be developed.

The coalition measures were modified for the specific requirements of this study. While two measures were used and an attempt was made to assess internal consistency, there was no prior data concerning their reliability or validity. It is suggested that such data be accumulated by applying these measures in other contexts and settings using various types of subjects.

Other limitations of this study apply to issues of external validity, or the generalizability of results. The task environment created in the experiment might be labeled a "near" organization, based on the taxonomy developed by Zelditch and Hopkins (1971). In the "near" organization, one is, in a sense, creating an analytic

slice of an organization. While subjects were aware that they were in an experimental setting, they performed a task which closely resembles a typical organizational task, that of purchase decision-making by functionally differentiated departments. Yet, it can be argued that students solving purchasing problems in a classroom exercise are not the same as engineers, marketers, or purchasing professionals in an actual organization. Further, it is not likely that one finds buying groups with only one type of reward system. Moreover, a wide range of other organizational and environmental variables may influence real-world purchasing processes. Clearly, then, the experimental task in this design did not match reality as it is commonly experienced. The purpose was not to mimic reality, though, it was to test theory. The external validity of research findings on organizational behavior has been addressed by Dipboye and Flanagan (1979). They found that the generalizability of results is a major problem in studies using the laboratory as well as field research, in part because differences between organizations are often as great as differences between the laboratory setting and the real-world organization.

This does not imply that the results have no generalizability. In research on organizational buying behavior, inter-organizational and inter-industry differences have presented a major barrier to drawing generalizations from the results. This research represents an attempt to overcome such a problem by isolating those organizational characteristics or properties that are relevant to the problem

at hand. As explained by Fromkin and Streufort (1976, p. 441),

"The argument that realism requires multiple similarities between laboratory and organizational settings seems greatly exaggerated. While it is true that experiments vary in the degree of resemblance to organizations, a laboratory event is not endowed with greater realism and generality because it occurs in a setting containing several attributes similar to characteristics of organizations. It is more likely that only a small number of variables are required to depict organizational phenomena in general."

The findings concerning the effects of rewards on perceived conflict and coalition formation can be generalized to real organizations to the extent that the reward manipulations represent levels of variability which one might encounter in the real world (Calder, et al., 1981). The reward systems represent end-points on a continuum and thus are anchors from which theory can be tested. They suggest what should happen in real-world organizations as we move toward arrangements encouraging reduced levels of competition or cooperation. So long as the rewards were meaningful to the subjects, their behavioral processes should provide a reasonable guide.

Lynch (1982) takes the somewhat extreme position that all background variables which are not specified in the theory, but which may interact with the theoretical variables of interest, must be included in the design to achieve external validity. Pointing to the possibility that the set of background factors which conceivably could interact with treatments is infinite, Calder, et al. (1982, p. 241) refer to this position as a "counsel of despair." Nonetheless, there are background factors which might be considered in future research efforts, given the basic relationship between rewards and

coalitions.

One of the key variables which was controlled for in this study was the resource/power positions of the departmental representatives. There is evidence, though, that resource differentials among group members may affect coalition formation (Caplow, 1956; Gamson, 1961; Gamson, 1964; Komorita and Chertkoff, 1973; Lawler and Youngs, 1975; Messe, Vallacher, and Phillips, 1975; Folkes and Weiner, 1977; Hinckley, 1979). It is not unrealistic that such differentials actually may exist in many organizational buying centers. Future research efforts should be directed at determining whether the resource/power positions of buying center members represents an additive or an interacting background factor. Larger samples may be required to provide the degrees of freedom necessary to estimate this and other background factors.

Other variables which warrant attention by those wishing to develop and expand the body of theory concerning rewards and coalitions in the buying center might include the type of purchase being made, the time pressure involved, and the structure imposed by the organization on the buying process. Lehman and O'Shaughnessy (1974) distinguish between routine order, procedural problem, performance problem, and political problem products. The coalitions which form may similarly vary as a function of the problems created by the product for the buying organization--especially where a purchase decision creates political problems. The time pressure involved in coming to a decision could conceivably affect coalitions in at least two

ways. Time pressure may limit coalitions, given the negotiation process involved in forming a coalition. Alternatively, dominant coalitions may play a greater role where insufficient time exists for opposition to solidify or for consideration of alternative positions. Formal structure may limit coalitions by imposing a procedure and individual task responsibilities on departments and individuals (e.g., Spekman and Stern, 1979). Again, the list of additional background factors is potentially endless. Examples might include the type of industry, company size, employee turnover, and involvement of top management in purchase decision-making.

The critical point here is that the limitations of this study in terms of external validity are by design. Progress has been made in testing a theory concerning an important potential cause of coalitions in industrial buying decisions. The strength of the findings will hopefully encourage research in which some of the limiting design constraints are relaxed.

Finally, the nature of the relationship between perceived conflict and coalition formation warrants further study. In the model tested in this study, both were conceptualized and measured as outcomes resulting from different types of reward systems. A number of additional possibilities should be investigated. Conflict might be conceptualized, to some degree, as an intervening variable between rewards and coalitions. Alternatively, conflict may also be heightened as a result of coalitions. While the extant literature provided support for the model as presented here, the relationship between

the independent measures may involve such complexities.

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APPENDIX 1:
JOB DESCRIPTIONS USED IN
PURCHASING EXPERIMENT

TITLE OF POSITION: Manager, Production

Basic Purpose

To manage and coordinate all areas of production, scheduling and related services to achieve timely production of quality parts at the most economical costs and in the proper quantities. To maintain and develop both a safe facility environment and workforce capable of meeting manufacturing requirements in the present and future to attain objectives in accordance with production and delivery schedules.

Duties and Responsibilities

1. Plans the use of facilities, equipment, and personnel to current and future manufacturing requirements, including department budgets and guidelines, plant layout and improvements, and capital expenditure programs.
2. Coordinates scheduling and delivery of component parts in sufficient quantity so as to maintain uninterrupted production.
3. Develops an operating budget for each section supervised and initiates action to operate within those fiscal plans.
4. Maintains uninterrupted production and product quality and quantity within the limitations of budget allocations.
5. Recommends, expedites, and coordinates procedures having to do with utilizing staff services to resolve manufacturing problems.
6. Manages production operation to ensure scheduled work flow and use of personnel, skills, machines, and facilities and directs and expedites correction of problems obstructing production procedures.
7. Uses motivating techniques and delegates responsibilities and authority to subordinate supervisory and staff personnel to achieve maximum efficiency through proper use of skills, man-hours, machines, and equipment.
8. Supervises inventories of machine replacement parts, materials, and supplies to ensure that they are maintained at proper levels.
9. Maintains a constant awareness of and takes corrective action on hazardous conditions and practices.
10. Compensates, motivates, and disciplines subordinates in accordance with current division policies and procedures.
11. Manages own department to provide optimum union relations in accordance with union contract. Provides accurate feedback by appropriate management personnel regarding potential union/labor problems and possible solutions.

Organizational Relationships

Reports directly to the Plant Manager. Directly supervises the Manager, assembly processes and Manager, scheduling. Frequent contact with other plant department heads and with other plant locations.

Position Specifications

Bachelor's Degree in Industrial Management or Industrial Engineering or related discipline plus a good knowledge of related areas to acquire sufficient background as to procedures, skill, and supervisory techniques. Eight to ten years of related manufacturing experience.

TITLE OF POSITION: Manager, Finance and Accounting

I. Responsibilities

- A. To develop and recommend broad financial policies; to supervise all financial functions of the Company, including accounting, auditing, banking, budgetary control, cash receipts and disbursements, credit and collections, methods and statistics, financing, insurance, payroll, and inventories.
- B. To safeguard corporate assets and establish and administer such control standards as may be required to insure the conservation, effective utilization and control of the Corporation's assets and capital structure.

II. Duties

- A. Administer the financial affairs of the company.
- B. Investigate, develop and formulate financial plans to insure provision of adequate funds to meet long-range and short-term requirements on the most economical and practical basis consistent with sound financial practices.
- C. Maintain relationships with financial, banking and other institutions, promoting goodwill toward the Company.
- D. Develop, recommend and supervise operation of an adequate system of forecasting the Company requirements for working capital.
- E. Formulate or cause to be formulated all Company policies, practices and procedures covering accounting, auditing, banking, budgetary control, cash receipts and disbursements, credits and collections, methods and statistics, financing, payroll, insurance, and inventories.
- F. Issue appropriate reports on the financial affairs of the Company; and interpret financial results, developments and conditions of the Company for the President and the Board of Directors.
- G. Prepare and recommend a program of expense for the Financial Department; manage its operations efficiently within cost limitations.
- H. Keep currently informed of business and economic conditions in all areas affecting the Company; appraise the financial implications of such conditions upon the Company.
- I. Keep the President informed of the over-all performance and results of the Company's financial activities and matters of particular interest and importance.

TITLE OF POSITION: Manager, Sales and Marketing

Basic Purpose

To plan, coordinate, and manage all sales and technical service activities related to the various company products from initial design to maintenance of approved programs.

Duties and Responsibilities

1. Bring to the sales organization products formulated to do the specific job for which they are intended at the right price, time and place to best satisfy customer requirements.
2. Review, recommend and implement advertising and sales promotion programs as related to product lines.
3. Accepts customers' pilot build requirements. Conveys required information to purchasing, engineering, and quality personnel, and ensures that various delivery requirements and functions are met.
4. Develops and recommends specific sales and marketing objectives and forecasts for products sold; manages the execution of authorized sales plans and marketing programs to achieve or exceed profit volume and other sales and marketing objectives.
5. Establishes target production dates and coordinates internal activities to ensure that first article production and facility approval will be obtained from the customer.
6. Coordinates the overall establishment of selling prices.
7. Advises manufacturing facilities of quality problems, ensuring that corrective action is taken and that customers are properly notified.
8. Participates in various presentations to customers on product improvements, price increases, new product programs, and other related matters.
9. Visits customers on a regular basis with department staff to maintain sound customer relations and acquire firsthand knowledge of customer reactions to product lines and to obtain new product ideas.
10. Ensures that all customer entertainment is in line with corporate policy and procedures.

Organizational Relationships

This position reports to the Vice-President, Marketing and Sales. Reporting to this position are twenty salespeople, three Liaison Engineers and related clerical support. Interfaces daily with manufacturing department, quality assurance, and engineering.

Position Specifications

Bachelor's Degree in Marketing or equivalent education/work experience with a minimum of 8-10 years related experience. Must possess a high level of maturity and exercise sound judgment in all dealings with customers.

TITLE OF POSITION: Manager, Design and Development Engineering

Basic Purpose

To plan, manage, organize, and schedule the work of design, layout, detail drafting, mode making, testing, and other related service activities associated with the development of all proposed company products.

Duties and Responsibilities

1. Confers with the Vice-President, Research and Development on engineering matters pertinent to the development of design drawings and specifications for new and modified products and components. Organizes, implements, and supervises project procedures, records, reference libraries, budget formulation, and controls. Prepares recommendations for consideration by management as to suitability of products researched and developed.
2. Assigns projects for design analysis, computer simulation, and drawing preparation and maintains close surveillance to ensure proper application of engineering principles, costs, project layout, and special part detail. Oversees the drafting of designs, layouts, and detailed part drawings. Organizes, implements, and administers the standardization of parts and the recording of specifications.
3. Collaborates with the Manager, Sales to assist in determining customers' needs.
4. Provides technical information to the Purchasing Department on matters dealing with the procurement of special materials, specifications, available sources, and services. Provides engineering advice and assistance to manufacturing on production problems.
5. Evaluates designs, specifications, manufacturing feasibility and costs, quality and reliability test data. Coordinates the development of sales literature, instruction books, parts lists, and similar material where technical advice and information are required.
6. Heads up various engineering projects by supervising the construction and testing of pilot models, components, and competitive models.
7. Assigns work to personnel engaged in the machining, fabrication, and construction of pilot models; in the mechanical and/or electrical testing of components and products; and in such metallurgical and chemical analyses as may be required.
8. Develops, supervises, and maintains own department in order to attain the required objectives. Compensates, motivates, and disciplines subordinates in accordance with division policy and procedure.
9. Ensures compliance with applicable laws and regulations issued by OSHA, EPA, and other federal, state and local regulatory agencies.

Organizational Relationships

This position reports to the Vice-President, Research and Development. It interrelates with other engineering departments, quality assurance, and purchasing regarding the coordination of technical information.

Position Specifications

Bachelor's Degree in Engineering or equivalent plus 8-10 years broad engineering experience, including experience in a supervisory position.

TITLE OF POSITION: Manager, Maintenance*Basic Purpose*

To supervise the maintenance activity through the implementation of a preventive maintenance program and an ongoing maintenance repair program for the facility, vehicles, production maintenance, and process equipment.

Duties and Responsibilities

1. Plans and implements effective procedures and policies for the maintenance department to ensure that all equipment, facilities, and utilities are in an acceptable state of repair.
2. Coordinates with vendors, suppliers, and contractors the installation of new equipment or equipment processes.
3. Ensure that all purchased components minimize wear and tear on plant equipment and manufactured products. Where relevant, ensure that vendors provide quality in-plant maintenance.
4. Supervises all daily activities of the Maintenance Department to ensure completion of assigned projects that will result in the least amount of machine downtime.
5. Monitors completion of maintenance projects to ensure that safety and quality standards are met.
6. Approves all requisitions relating to new and replacement parts, supplies, machinery, and equipment for the Maintenance Department.
7. Provides technical knowledge and expertise to solve problems of a mechanical, electrical, or hydraulic/pneumatic nature.

Organizational Relationships

This position reports to the Plant Manager. Reporting to this position are two foremen and up to ten hourly employees. Coordinates work with all service and production departments.

Position Specifications

Must possess Master Electrician's License plus 8-10 years experience in maintenance, engineering, or related fields. Prefer minimum of 3-5 years supervisory experience. Must be familiar with each of the following areas: boilers, air compressors, heating and air conditioning, plumbing, welding, carpentry, electrical/electronic equipment, pneumatic hydraulics, and heavy manufacturing equipment.

TITLE OF POSITION: Manager, Purchasing*Basic Purpose*

To plan, direct, and control activities relating to the procurement of materials used in the manufacture of division products. To ensure cost effectiveness for all purchased items. To develop and install policies and procedures which ensure an efficient procurement operation.

Duties and Responsibilities

1. Directs the procurement of the division's raw materials, purchased parts, service equipment, and operating supplies at the lowest possible price consistent with accepted standards of quality and service, avoiding long term contracts where possible.
2. Establishes and recommends approval of budgets for Purchasing Department. Maintains necessary controls to keep expenditures within such budgetary limitations.
3. Prepares periodic reports indicating record of achievement on cost-minimization, recommended improvements, personnel requirements, and other related matters.
4. Manages and maintains a balanced organization possessing flexibility, maturity, and experience in purchasing to support short-and long-range requirements effectively.
5. Directs the sale of division assets, equipment, and materials classified as obsolete or scrap.
6. Establishes and monitors, through the purchasing groups, an annual cost improvement program equal to no less than a predetermined percentage of the total purchased materials per year under corporate policy and procedure.
7. Directs the supervision of the division's transportation fleet in the movement of materials, supplies, parts assemblies, and equipment in accordance with corporate transportation procedures.
8. Maintains various product and cost reports to identify potential areas for cost reduction efforts; performs cost studies as requested.
9. Develops and administers programs to add qualified suppliers and to encourage present suppliers to expand within guidelines of established policies.
10. Maintains contact with all markets in which the company obtains materials, and keeps the Vice-President, Operations fully advised of market status, trends, availability, and projected performance.

Organizational Relationships

This position reports to the Vice-President, Operations. Reporting to this position are five Buyers, one Secretary, and one expeditor.

Position Specifications

Bachelor's Degree in Business Administration or equivalent education/work experience in purchasing and materials, with established contacts in related markets; high degree of integrity in conducting business affairs.

TITLE OF POSITION: Manager, Quality Assurance

Basic Purpose

To provide, implement, and administer quality assurance and control related functions to ensure product reliability and conformance to high quality standards and customer/federal specifications in the most effective manner possible.

Duties and Responsibilities

1. Maintains satisfaction as to quality through internal and external inspection services of raw materials, finished items purchased, and production operations and processes.
2. Establish ongoing value analysis program within vendors, where major component parts of all purchased items are evaluated to determine their cost effectiveness, efficiency, and whether or not the firm would be better off making them rather than purchasing them.
3. Conducts and/or supervises studies to determine cause, effect, and corrective measures required to remedy deviations from desirable standards of quality.
4. Confers with engineering and production personnel and in conjunction with them resolves problems of product design, materials, tooling, and production operations affecting quality.
5. Conducts customer and supplier visitations as required to confer on specific quality problems.
6. Ensures establishment of and compliance with appropriate procedures in layout, testing, and other quality-assurance-related areas.
7. Provides technical assistance to purchasing department in such areas as interpretation of specifications, design concepts, and related information in connection with purchased items.
8. Conducts periodic training sessions to keep personnel informed on procedures, use of equipment, and other quality assurance techniques.
9. Establishes procedures that will properly detail the inspection of component parts.
10. Reviews and evaluates all variances on component parts that do not meet prescribed tolerances.
11. Ensures documentation and maintenance of records, drawings, and other data related to product reliability.
12. Ensures compliance with applicable laws and regulations issued by OSHA, EPA, and other federal, state, and local regulatory agencies.

Organizational Relationships

This position reports directly to the Plant Manager. Coordinates activities with customers and vendors for all reliability and quality assurance standards. Provides technical assistance to manufacturing in the development of test equipment and gauges.

Position Specifications

Bachelor's Degree and/or equivalent education/work experience, including supervisory experience, plus 8-10 years experience in quality control and/or engineering. Requires comprehensive knowledge of quality control standards and procedures.

TITLE OF POSITION: Manager, Purchasing

Basic Purpose

To plan, direct, and control activities relating to the procurement of materials used in the manufacture of division products. To ensure cost effectiveness for all purchased items. To develop and install policies and procedures which ensure an efficient procurement operation.

Duties and Responsibilities

1. Directs the procurement of the division's raw materials, purchased parts, service equipment, and operating supplies at the lowest possible price consistent with accepted standards of quality and service, avoiding long term contracts where possible.
2. Establishes and recommends approval of budgets for Purchasing Department. Maintains necessary controls to keep expenditures within such budgetary limitations.
3. Prepares periodic reports indicating record of achievement on cost-minimization, recommended improvements, personnel requirements, and other related matters.
4. Manages and maintains a balanced organization possessing flexibility, maturity, and experience in purchasing to support short-and long-range requirements effectively.
5. Directs the sale of division assets, equipment, and materials classified as obsolete or scrap.
6. Establishes and monitors, through the purchasing groups, an annual cost improvement program equal to no less than a predetermined percentage of the total purchased materials per year under corporate policy and procedure.
7. Directs the supervision of the division's transportation fleet in the movement of materials, supplies, parts assemblies, and equipment in accordance with corporate transportation procedures.
8. Maintains various product and cost reports to identify potential areas for cost reduction efforts; performs cost studies as requested.
9. Develops and administers programs to add qualified suppliers and to encourage present suppliers to expand within guidelines of established policies.
10. Maintains contact with all markets in which the company obtains materials, and keeps the Vice-President, Operations fully advised of market status, trends, availability, and projected performance.

Organizational Relationships

This position reports to the Vice-President, Operations. Reporting to this position are five Buyers, one Secretary, and one expeditor.

Position Specifications

Bachelor's Degree in Business Administration or equivalent education/work experience in purchasing and materials, with established contacts in related markets; high degree of integrity in conducting business affairs.

APPENDIX 2:
PURCHASING PROBLEM SCENARIOS

Tub Assembly Purchase Decision

Dura-Prod Corporation produces a number of durable consumer products for the home, including washing machines. Dura-Prod's machines compete in the medium quality, medium price segment of the market. Company officials were recently surprised to hear that EMR Company, its principle source of washing machine tub assemblies for many years, was declaring bankruptcy. There are no emergency problems with meeting Dura-Prod's need for tub assemblies because of a temporary decline in the demand for washing machines and a sizable inventory of assemblies. However, a decision must now be made concerning a substitute source of supply.

The tub assembly is a principle component in washing machines. It consists of a number of parts, including the tub itself, the agitator, a transmission, and the post on which the agitator sits. Some models also include lint filters, fabric softener dispensers, and liquid bleach dispensers. Assemblies are manufactured to the specifications of Dura-Prod's design engineers, with new model designs appearing approximately every two years. Dura-Prod anticipates an approximate annual requirement of 46,000 tub assemblies.

As dictated by company policy, a number of bids have been solicited by the purchasing department, with seven vendors qualifying for further consideration. Listed below are fact sheets consisting of key data for each of the vendors.

VENDOR A

Product Quality: Very good; reject rate on delivered assemblies less than .5%;

Delivery: Averages two weeks; can respond quickly to demand fluctuations;

Price: \$120 per unit; 5% discount on orders of 1000 or more; Requires three year exclusive contract;

Overall Company Reputation: Well-established and respected;

Other Comments: Vendor A's tub assemblies are quite difficult to install; Vendor A is a major customer of ours, purchasing 8 percent of the annual sales of Dura-Prod's industrial products division; Vendor A's tub assemblies include a removable and repairable transmission, which is a very marketable feature.

VENDOR B

Product Quality: Excellent; Reject rate on delivered assemblies less than .05%; appears to be the highest quality product on the market;

Delivery: Average three weeks; subject to occasional labor disruptions;

Price: \$140 per unit; 5% discount on orders of 100 or more; Requires minimum orders of 45000 tub assemblies per year;

Overall Company Reputation: Excellent;

Other Comments: Vendor B's salesforce is known for being overly aggressive, as well as for spending very little time at customer locations; Vendor B competes with Dura-Prod's industrial products division on a number of items; Is willing to develop an ongoing value analysis program with Dura-Prod's quality control staff.

VENDOR C

Product Quality: Good; Company offers 100% return policy on rejects;

Delivery: Averages three weeks; maintains 60 day supply of all tub assembly parts in inventory;

Price: \$110 per unit; offers liberal six month payment period; 10% discount on orders of 500 or more; terms 3/10 n 30; Vendor C will

finance purchases at competitive interest rates;

Overall Company Reputation: Financially sound, conservative;

Other Comments: Somewhat limited production facilities; Is not capable of responding quickly to a large order on short notice.

VENDOR D

Product Quality: Average;

Delivery: Average one week or less; Maintains six month inventory of all tub assembly component parts;

Price: \$131 per unit list price;

Overall Company Reputation: Known for its flexibility in dealing with a customers production scheduling needs;

Other Comments: Vendor D's assemblies are easy to install. Can respond quickly to special orders of any size; Offers excellent training programs for employees on assembly and installation. Maintenance of their assemblies is difficult.

VENDOR E

Product Quality: Vendor E's tub assemblies are compatible with, and will minimize wear and tear on, Dura-Prod's facilities and equipment;

Delivery: Averages three weeks;

Price: \$125 per unit list price;

Overall Company Reputation: Good;

Other Comments: Vendor E will service any of its assemblies in Dura Prod's plant; It's assemblies are noted for ease of installation and maintenance; Cannot respond quickly to special orders and has relatively small production facilities.

VENDOR F

Product Quality: Very good; Reject rate on delivered assemblies less than .5%;

Delivery: No data available;

Price: \$135 per unit;

Overall Company Reputation: Very good; Widely recognized Company with a number of known brand names; Also known for its ability to meet engineering design specifications;

Other Comments: Vendor F is known for its flexibility in responding to the engineering design and development needs of its customers; It's research and development staff is known for being innovative.

VENDOR G

Product Quality: No data available; Vendor G is new to the tub assembly market and so is not a major brand name; Has quite modern facilities;

Delivery: Guarantees 1-2 week delivery;

Price: \$100 per unit; 10% discount on order over 500 units; Terms 2/10 n 30:

Overall Company Reputation: Dura-Prod has been satisfied in its dealings with Vendor G in other product areas; Not known for its technical service or maintenance offered;

Other Comments: Vendor G has a strong salesforce providing excellent sales service, with which Dura-Prod's purchasing staff has dealt and been highly satisfied; Dura-Prod has purchased a number of other items from Vendor G in the industrial products area, such that a strong vendor relationship exists; Vendor G's tub assemblies appear somewhat difficult to install.

Clothes Dryer Motor Decision

Dura-Prod Corporation produces a number of durable consumer appliances for the home, including washing machines and dryers. Dura-Prod's machines compete in the medium-quality, medium-price segment of the market. While washing machine sales have consistently met management's sales objectives, dryers have been a disappointment. As a result, the company's design engineers have developed an entirely new line of dryers for which production will hopefully begin in three months. One of the component parts that must be purchased for this new line of dryers is a heavy duty motor.

The motor in a dryer serves two main functions. First, it is connected by a rubber belt to the drum in which clothes are placed. The motor drives the belt, which turns the drum, enabling the clothes to tumble dry. Second, the motor powers a blower that circulates air which has been warmed by a heating element. The hot air circulates through the rotating clothes drum. The motor must shut off automatically when the door to the dryer is opened, when a thermostat indicates the fabrics have attained a certain level of dryness, and/or when the timer expires. It is estimated that the company will need 50000 motors in the first year.

As dictated by company policy, a number of bids have been solicited by the purchasing department, with seven vendors qualifying for further consideration. Listed below are fact sheets for each of the vendors.

VENDOR A

Product Quality: Good;

Delivery: Average four weeks; Cannot respond quickly to special orders or sharp changes in demand;

Price: \$75 per unit; Requires 3 year exclusive contract;

Overall Company Reputation: Not especially technologically advanced;

Other Comments: Vendor A's motors are easy to maintain; installation of the firm's motors will most likely minimize wear and tear on Dura-Prod's production equipment; Offers good in-plant maintenance on its motors where problems arise.

VENDOR B

Product Quality: Good; Offers 100% return policy on rejects;

Delivery: Average three weeks; maintains 60 day supply of all motor assembly parts in inventory;

Price: \$67 per unit; terms 3/10 n 30; Offers liberal twelve-month payment period if Dura-Prod will sign up an exclusive three year contract; Vendor B will finance purchases at competitive interest rates; 10% discount on orders of 500 or more;

Overall Company Reputation: Fiscally sound, conservative company known for its creative financing;

Other Comments: Questionable sales service and maintenance service; Not clear how Vendor B's motors will perform in terms of the automatic shut-off features desired by marketing.

VENDOR C

Product Quality: Excellent; appears to be the highest quality product on the market; Is willing to establish value analysis program with Dura-Prod's quality control staff;

Delivery: Averages three weeks in part due to small production facilities; Vendor C maintains virtually no inventory, in that production is geared to orders as they come in;

Price: \$77 per unit;

Overall Company Reputation: Known as the top of the line in terms of the quality of its finished motors:

Other Comments: Vendor C produces an excellent standardized motor, which is compatible with Dura-Prod's dryers, although it somewhat ignores the specifications of Dura-Prod's design engineers; Vendor C's motors are difficult to install, requiring special training and tools.

VENDOR D

Product Quality: Good;

Delivery: Average two weeks; can respond quickly to fluctuations in sales;

Price: \$73 per unit;

Overall Company Reputation: Well-established and respected;

Other Comments: While Vendor D's motors do not meet the design specifications of Dura-Prod's engineers, they can be used in its dryers; Vendor D's motors have the shut-off feature desired by marketing; Vendor D offers poor technical service, maintenance and training; Its motors are easy to remove and service by a repairman, which is a marketable feature that dryer retailers find especially appealing;

VENDOR E

Product Quality: Historically very good; brand name;

Delivery: Average three weeks, and only maintains small inventories of finished motors and parts;

Price: \$74 per unit;

Overall Company Reputation: Very good; Recommended by engineers

Other Comments: Vendor E has a strong reputation for satisfactorily meeting the engineering design specifications of its customers and for flexibility in anticipating and responding to design changes; The firm is on top of the state-of-the-art in new engineering developments; Vendor E has had occasional problems of late with quality control in part due to internal labor problems;

VENDOR F

Product Quality: Acceptable

Delivery: Guarantee seven days or less; maintains 35% of anticipated 90-day demand for motors in inventory;

Price: \$75 per unit; requires two year exclusive contract;

Overall Company Reputation: Known for its flexibility and reliability in dealing with a company's production scheduling needs;

Other Comments: Vendor F's motors are fairly easy to install, and are very compatible with Dura-Prod's production process; does not offer very good maintenance services for its motors, does have an excellent training program for Dura-Prod's production department staff.

VENDOR G

Product Quality: Good;

Delivery: Two weeks;

Price: \$65 per unit; 5% discount on order of 100 or more;

Overall Company Reputation: Dura-Prod has been satisfied in its dealings with Vendor G in other product areas; not known for its technical service or maintenance offered;

Other Comments: Dura-Prod's purchasing staff has developed a strong vendor relationship with Vendor G over the years; Vendor G provides excellent sales service, and works closely with the purchasing department to keep members abreast of new technological and competitive developments in the motor field; Installation and removal of Vendor G's motors is difficult.

Transmission Housing Decision

Dura-Prod Corporation produces a number of durable consumer products for the home, including washing machines. Dura-Prod's machines compete in the medium quality, medium price segment of the market. A number of the component parts which are used by Dura-Prod in manufacturing washing machines are purchased from other firms, such as the tub assembly, the transmission, and the adjustable leveling legs. They also purchase housings made from iron castings which protect the transmission from vibrations and dirt. For the past seven years, these protective housings have been purchased from Lee Foundry Company.

Lee Foundry Company has just been shut down by a strike, the third of its kind in the last five years. The union at Lee, the Federation of Foundry Workers is very belligerent of late, and prospects are poor for a quick settlement. Further, the ultimate strike agreement is likely to necessitate an increase in the price of transmission housings, perhaps to \$2.70 per unit from the current \$2.40.

Senior management at Dura-Prod has made the decision to switch to an alternative source of supply immediately. Inventories are sufficient to meet washing machine production requirements for three months. It will take the new vendor a number of weeks to start production, however, in that its production facilities must be adjusted for the transmission housing casting desired by Dura-Prod.

As dictated by company policy, a number of bids have been solicited by the purchasing department, with seven vendors qualifying for further consideration. Listed below are fact sheets for each of the vendors.

VENDOR A

Product Quality: Good;

Delivery: Guarantee ten days or less; maintains 30% of anticipated annual orders in inventory;

Price: \$2.60 per unit; Requires 5 year exclusive contract;

Overall Company Reputation: Known for its flexibility in dealing with a customer's production scheduling needs, but not for its technical know-how;

Other Comments: Vendor A's transmission housings are easy to install, but maintenance on them is difficult; full-scale production can begin in three weeks.

VENDOR B

Product Quality: Good;

Delivery: 2 weeks;

Price: \$2.45 per unit; 5% discount on orders of 100 or more;

Overall Company Reputation: Dura-Prod has been satisfied in its dealings with Vendor B in other product areas; not known for its technical service or maintenance offered;

Other Comments: Dura-Prod's purchasing staff has developed a strong relationship with Vendor B over the years. Provides excellent sales service; installation and removal of Vendor B's transmission housings is somewhat complex; full-scale production can begin in 7 weeks.

VENDOR C

Product Quality: Very good; a well-known brand name;

Delivery: Average 4-6 weeks; Not known for reliability in this area;

Price: \$2.60 per unit;

Overall Company Reputation: Widely-recognized company name;

Other Comments: Has a strong reputation for precision in fulfilling the engineering design specifications of its customers and for flexibility in anticipating and responding to design changes. Can begin full-scale production in 7 weeks; Noted for sharing information concerning new technical developments with the engineering staff of its customers; Occasional problem with quality control;

VENDOR D

Product Quality: Excellent; appears to be the highest quality product on the market; Reject rate on installed housings less than .01%;

Delivery: Average four weeks; Vendor D maintains virtually no inventory;

Price: \$2.75 per unit;

Overall Company Reputation: Excellent;

Other Comments: Designs and manufactures its own transmission housings, and thus will not use the design of Dura-Prod's engineers; however, its housings should be compatible with Dura-Prod's washing machines; Will develop an ongoing value analysis program with Dura-Prod's quality control staff; can begin production in 2 weeks.

VENDOR E

Product Quality: Good; company offers 100% return policy on rejects;

Delivery: Averages 3-4 weeks; maintains 60 day supply of housings in inventory;

Price: \$2.55 per unit; offers liberal six month payment period if Dura-Prod will sign an exclusive 2 year contract; 10% discount on orders of 500 or more; terms 3/10 n 30;

Overall Company Reputation: Fiscally sound, conservative company, known for its creative financing;

Other Comments: Vendor E's transmission housings are very complex to install, and are not especially compatible with Dura-Prod's assembly line equipment, although they can be used; is not capable of responding quickly to large orders on short notice; can begin production in seven weeks.

VENDOR F

Product Quality: Good;

Delivery: Average 4 weeks; maintains small inventory;

Price: \$2.50 per unit; requires 3 years exclusive contract;

Overall Company Reputation: Unknown; Vendor F is a fairly new company (less than 2 years old) and has no established track record;

Other Comments: Vendor F's transmission housings are easy to install and maintain; the firm's product is very compatible with Dura-prod's equipment, and will minimize wear and tear on Dura-Prod's facilities; Cannot respond quickly to special orders; can begin full-scale production in six weeks; will provide in-plant maintenance.

VENDOR G

Product Quality: Good;

Delivery: Averages two weeks; can respond to demand fluctuations;

Price: \$2.55 per unit; 5% discount on orders of 200 or more;

Overall Company Reputation: Company is well-established and respected;

Other Comments: Is a customer of ours, purchasing 5 percent of the annual sales of Dura-Prod's Industrial Products Division; Can begin production in five weeks; Housings are easily removable by a service repairman, which is a marketable feature washing machine dealers find especially appealing; Installation requires special training and tools.

Ice Maker Purchase Decision

Dura-Prod Corporation produces a number of durable consumer products for the home, including refrigerators. Dura-Prod has a reputation for producing a reliable, standardized product at a reasonable price, and for its dependable service after the sale. Recently, senior management decided the firm could no longer ignore many of the special features most of its competitors had added to their refrigerators. Specifically, it has been decided to add an ice-making feature as an option with all the refrigerators in the company line, and a source of supply must now be found.

An ice maker consists of a number of component parts, including a small motor, an adapter plug to the refrigerator electrical system, plastic water tubing within the ice maker, copper tubing from the ice maker to the water source, an ice molding tray, an ice storage container, a plastic arm which pushes the frozen ice from the tray to the storage container, and a thermostat. The basic design work is done by the manufacturer of the ice maker, although the manufacturer's product should meet the specifications of the design engineers at Dura-Prod regarding ice storage capacity, unit size, electrical wiring and voltage restrictions, and ice production.

As dictated by company policy at Dura-Prod, a number of bids have been solicited by the purchasing department, with seven vendors qualifying for further consideration. Listed below are fact sheets for each of the vendors.

VENDOR A

Product Quality: Excellent; appears to be the highest quality product on the market; Will establish value analysis program with Dura-Prod's quality control staff;

Delivery: Average five weeks in part due to small production facilities; Maintains small inventory;

Price: \$63 per unit;

Overall Company Reputation: Known as the top of the line in terms of the quality of its finished products;

Other Comments: Vendor A produces an excellent standardized ice maker, which is compatible with Dura-Prod's refrigerators, although it somewhat ignores the specifications of Dura-Prod's design engineers; Difficult to install, requiring special training and tools.

VENDOR B

Product Quality: Good;

Delivery: Averages two weeks; can respond quickly to fluctuations in refrigerator sales;

Price: \$55 per unit;

Overall Company Reputation: Produces a number of well-known brand names;

Other Comments: Although Vendor B's ice makers do not exactly meet the design specifications of Dura-Prod's engineers, they can be used in its refrigerators. Further, they are very attractive in appearance, which may help sell Dura-Prod's refrigerators. Vendor B's ice makers are easy to service by a repairman, which is a marketable feature that refrigerator dealers find especially appealing; Offers poor technical service and training, and its ice makers are difficult to maintain while in the refrigerator factory.

VENDOR C

Product Quality: Good;

Delivery: Average four weeks; factory equipment is well maintained but aging, leading to occasional production disruptions; maintains small inventory;

Price: \$53 per unit; requires two year exclusive contract;

Overall Company Reputation: Well-established firm;

Other Comments: Vendor C's ice makers are easy to install and maintain; Installation of the firm's ice makers will most likely minimize wear and tear on Dura-Prod's production equipment; Offers very good in-plant maintenance for its ice makers where problems arise; cannot respond quickly to special orders or sharp increases in demand.

VENDOR D

Product Quality: Good;

Delivery: Guarantee seven days or less; maintains 30% of anticipated 90-day demand in inventory;

Price: \$54 per unit; requires two year exclusive contract;

Overall Company Reputation: Known for its flexibility and reliability in dealing with a company's production scheduling needs;

Other Comments: Vendor D's ice makers are fairly easy to install, and are very compatible with Dura-Prod's production process; Offers poor maintenance service to its customers.

VENDOR E

Product Quality: Appears to be good; Offers 100% return policy on rejects;

Delivery: Averages 3-4 weeks; will maintain 60 day supply of ice makers for Dura-Prod in inventory;

Price: \$50.00 per unit; offers liberal twelve month payment plan if Dura-Prod will sign an exclusive two year contract; Will finance purchases at competitive interest rates; terms 2/10 n 30;

Overall Company Reputation: Fiscally sound, conservative company known for its creative financing;

Other Comments: Vendor E's ice makers are complex to install, given Dura-Prod's production process and equipment; is not capable of responding quickly to large orders.

VENDOR F

Product Quality: Good;

Delivery: Two weeks; Dependable;

Price: \$48.00 per unit; 5% discount on orders of 100 or more; terms 2/10 n 30;

Overall Company Reputation: Dura-Prod has been satisfied in its dealings with Vendor F in other product areas; not known for its technical service or maintenance offered;

Other Comments: Dura-Prod's purchasing staff has developed a strong vendor relationship with Vendor F over the years. Provides excellent sales service, and works closely with the purchasing department to keep members abreast of new technological and competitive developments. Installation and removal of Vendor F's ice makers is somewhat difficult and they are not the most technologically advanced.

VENDOR G

Product Quality: Historically very good; widely known brand name;

Delivery: Average six weeks; slight possibility of occasional labor disruptions; Vendor G maintains very small inventories of ice makers;

Price: \$60.00 per unit;

Overall Company Reputation: Vendor G has been well-known and respected by its competitors and customers for sixty years;

Other Comments: Has a strong reputation for its performance in satisfactorily meeting the engineering design specifications of its customers and for flexibility in anticipating and responding to design changes. Vendor G has had occasional problems of late with quality control, in part due to internal labor union problems.

APPENDIX 3:
FORMS USED BY OBSERVERS IN
PURCHASING EXPERIMENT

Departmental Observer Report Form

Instructions to Group Observer: Please record answers to each of the questions below based on your observations of the departmental group to which you've been assigned. Be attentive to their deliberations, and observe the group carefully throughout the decision-making process. Do not answer questions or participate in the group in any way. You are not to say anything to group members.

1. What department did you observe? _____
2. What was the product which group members were deciding upon? _____
3. Indicate the name of departmental members:

4. Please indicate how the group members collectively decided to rank the vendors in the order of the department's preference. The most preferred should be given a rank of 1, the second most preferred a rank of 2, the third most a rank of 3. Only the three most preferred vendors should be specified.
 - a) most preferred vendor _____
 - b) second preferred vendor _____
 - c) third most preferred vendor _____
5. Please indicate any observations concerning unusual developments or things that stand out about this group as it attempted to make a decision. Leave the space below blank if nothing really stood out.

Inter-Departmental Group Activity Summary

Instructions to Group Observer: Please record answers to each of the questions below based on your observations of the decision group to which you've been assigned. Be attentive to their deliberations, and observe the group carefully throughout the decision-making process. Do not answer questions or participate in the group in any way. You are not to say anything to group members.

1. What was the product which group members were deciding upon? _____
2. Indicate the name and sex of each departmental representative in your group. After a final vote has been taken, indicate the vendor each person voted for.

	<u>Name</u>	<u>Sex</u>	<u>Vendor voted for</u>
a. Purchasing dept. representative _____	_____	_____	_____
b. marketing dept. " _____	_____	_____	_____
c. production dept. " _____	_____	_____	_____
d. maintenance dept. " _____	_____	_____	_____
e. finance/acctg. dept. " _____	_____	_____	_____
f. quality control dept. " _____	_____	_____	_____
g. design engineering dept. " _____	_____	_____	_____
3. Which of the following is most descriptive of the way group members behaved while deliberating the decision:
 - _____ a. Competed aggressively with each other
 - _____ b. Competed somewhat with each other
 - _____ c. Both cooperated and competed to some degree
 - _____ d. Cooperated somewhat with others
 - _____ e. Cooperated a great deal with others
4. Which of the following is most descriptive of this group as it attempted to reach a decision:
 - _____ a. Group members primarily acted alone or individually
 - _____ b. Although some members acted individually, a few alliances formed within the group
 - _____ c. A number of competing alliances were formed within the group
 - _____ d. The group members acted in unison, with few people forming alliances or acting alone.
5. Indicate the names of any group members that you think formed alliances or coalitions with one another: _____
6. Please indicate any observations you have concerning unusual developments or things that stand out about this group as it attempted to make a decision. _____

APPENDIX 4:
WRITTEN EXPLANATIONS OF
REWARD SYSTEMS

COOPERATIVE REWARD SYSTEM

How You Can Earn Points

1. When in your department, you will rank-order your top three vendor choices.
2. While interacting with representatives of other departments in the interdepartmental group, you are trying to come to some agreement on a single vendor for the firm. A decision is reached only if at least four of the seven representatives of the various departments agree on one vendor.
3. The designated group observer will award points based on how well you represented your department and yet managed to come up with an interdepartmental decision that creatively reflected the interests of all departments. The observer can award either 3 points, 2 points, or 1 point to members of the group. Keep in mind that all members of an interdepartmental group receive the same number of points, no matter how each member voted.
4. In summary, all members of an interdepartmental group will receive the same number of points, but that total can vary depending on how creatively they come to a decision which reflects all their interests.

COMPETITIVE REWARD SYSTEM

How You Can Earn Points

1. When in your department, you will rank-order your top three vendor choices.
2. While interacting with representatives of other departments in the interdepartmental group, you are trying to come to some agreement on a single vendor for the firm. A decision is reached only if at least four of the seven representatives of the various departments agree on one vendor.
3. The person in the interdepartmental group whose department ranked the winning vendor highest receives three points. All others in the interdepartmental group receive no points. If no majority is reached, then no one gets any points.

(Example: Assume the interdepartmental group agreed by a 4-3 vote that Vendor X was to be chosen. If the maintenance department ranked Vendor X first, while all other departments ranked Vendor X second, third, or not at all, then the maintenance department representative to that interdepartmental group receives three points. All other members of that interdepartmental group receive no points. Note that if maintenance had ranked Vendor X second, but everyone else ranked Vendor X third or not at all, the maintenance representative would still get all three points.)

INDEPENDENT REWARD SYSTEM

How You Can Earn Points

1. When in your department, you will rank-order your top three vendor choices.
2. While interacting with representatives of other departments in the interdepartmental group, you are trying to come to some agreement on a single vendor for the firm. A decision is reached only if at least four of the seven representatives of the various departments agree on one vendor.
3. If the majority decision of the interdepartmental group is the same as your own department's first preference, you earn 3 points.
If the majority decision of the interdepartmental group is the same as your own department's second preference, you earn 2 points.
If the majority decision of the interdepartmental group is the same as your own department's third preference, you earn 1 point.
4. If no majority is reached, none of the members of that interdepartmental group receive any points. You also receive no points if your department did not rank that vendor selected by the interdepartmental group.

APPENDIX 5:
EXIT SURVEY
(MANIPULATION CHECKS)

Purchasing Study Exit Survey

Directions: Please answer each of the following questions as completely as possible based on your experiences in the various purchase decision processes in which you have just participated. If you have additional comments or reflections on any aspect of the exercise, please feel free to indicate them at the end.

1. What do you think the researcher was trying to accomplish in this project?
2. Describe the three major concerns of the departmental position you were asked to fill. That is, what do you think the organization expected of people filling your job. This should be answered in general, not just in terms of making vendor choices.
 - a. _____
 - b. _____
 - c. _____
3. What were your department's principle concerns in purchasing decisions?
4. Briefly describe your interpretation of how the point system worked. Specifically, how ere you instructed that you could earn points?
5. Did the way you were rewarded encourage people to take a competitive attitude toward one another?
 - _____ a. very definitely
 - _____ b. somewhat
 - _____ c. I am unsure
 - _____ d. probably not
 - _____ e. definitely not

6. Did the way you were rewarded encourage people to take a cooperative attitude toward one another?
- ☐ a. very definitely
 - ☐ b. somewhat
 - ☐ c. I am unsure
 - ☐ d. probably not
 - ☐ e. definitely not
7. In general, do you think the point system primarily encouraged you to (please check on):
- ☐ a. compete aggressively with others
 - ☐ b. compete somewhat with others
 - ☐ c. both cooperate and compete to some degree
 - ☐ d. cooperate somewhat with others
 - ☐ e. cooperate a great deal with others
8. When you were evaluating the various vendors, how similar or different did you find them to be (please check one):
- ☐ a. they were extremely similar
 - ☐ b. they were somewhat similar
 - ☐ c. they were not especially similar or different
 - ☐ d. they were somewhat different
 - ☐ e. they were extremely different
9. How realistic do you think the exercise was in representing an actual organizational decision process (please check one):
- ☐ a. very realistic
 - ☐ b. more realistic than not
 - ☐ c. had equally realistic and unrealistic aspects
 - ☐ d. more unrealistic than not
 - ☐ e. very unrealistic
10. How much impact did the \$25 connected with this exercise have on the way you behaved?
- ☐ a. a very significant impact
 - ☐ b. a significant impact
 - ☐ c. a moderate impact
 - ☐ d. a relatively small impact
 - ☐ e. no impact at all
11. Would you have acted differently if the reward was greater?
- ☐ a. very definitely
 - ☐ b. most likely
 - ☐ c. I am unsure
 - ☐ d. unlikely
 - ☐ e. definitely not
12. Would you have acted differently if the reward was smaller?
- ☐ a. very definitely
 - ☐ b. most likely
 - ☐ c. I am unsure
 - ☐ d. unlikely
 - ☐ e. definitely not
13. In coming to vendor decisions within the buying groups, which of the following best describes your behavior (please check one):
- ☐ a. primarily worked alone
 - ☐ b. formed alliance with others
14. What department did you represent? _____
15. Your name _____
- Additional Comments:

APPENDIX 6:
QUESTIONNAIRE USED TO MEASURE
PERCEIVED CONFLICT AND COALITION
FORMATION (NORTON MEASURE)

Post - Purchasing Questionnaire

Part A

Directions: Please read the following items carefully, and think about how well each one applies to the interdepartmental group in which you just participated. In the blank space before the statement, fill in the letter that corresponds with how much you feel the statement is true or false.

- A - Definitely true
- B - Mostly true
- C - Neither true nor false
- D - Mostly false
- E - Definitely false

- ___ 1. The group operates with sets of conflicting plans.
- ___ 2. The group is working toward many different goals.
- ___ 3. The group has major purposes which to some degree are in conflict.
- ___ 4. There are two or three members of the group who generally take the same side on any group issue.
- ___ 5. Certain members are hostile to other members.
- ___ 6. There is constant bickering among members of the group.
- ___ 7. Members know that each one looks out for the other one as well as for himself.
- ___ 8. Certain members of the group have no respect for other members.
- ___ 9. Certain members of the group are considered uncooperative.
- ___ 10. There is a constant tendency toward conniving against one another among parts of the group.
- ___ 11. Members of the group work together as a team.
- ___ 12. Certain members of the group are responsible for petty quarrels and some animosity among other members.
- ___ 13. There are tensions between subgroups which tend to interfere with the group's activities.
- ___ 14. Certain members appear to be incapable of working as part of the group.
- ___ 15. There is an undercurrent of feeling among members which tends to pull the group apart.

Part B

Directions: Below is a list of the departments represented in the purchase decision in which you just participated. In the space provided below, please indicate the persons from other departments with whom you worked the first, second, and third most closely while attempting to select a vendor. Specify the department, not the person's name.

- A) Purchasing representative
- B) Design engineering representative
- C) Marketing representative
- D) Maintenance representative
- E) Finance/Accounting representative
- F) Production representative
- G) Quality Control representative

- 1) With whom did you work the most? _____
- 2) With whom did you work the second most? _____
- 3) With whom did you work the third most? _____

Finally, please fill - in the answers to the following:

- 4) Your name _____
- 5) The department you represent _____

APPENDIX 7:
DATA FROM MANIPULATION CHECKS

INDEPENDENT TREATMENT

	25	9	0	0	1
a. Did the way you were rewarded encourage people to take a competitive attitude toward one another?	<u>Very</u> definitely	<u>Somewhat</u>	<u>I am</u> unsure	<u>Probably</u> not	<u>definitely</u> not
b. Did the way you were rewarded encourage people to take a cooperative attitude toward one another?	<u>10</u> Very definitely	<u>10</u> Somewhat	<u>4</u> I am unsure	<u>8</u> Probably not	<u>3</u> definitely not
c. Do you think the point system primarily encourage you to:	<u>3</u> Compete aggressively	<u>10</u> Compete somewhat	<u>20</u> Both cooperate and compete	<u>1</u> Cooperate somewhat	<u>1</u> Cooperate a great deal
d. How similar or different were the various vendors?	<u>3</u> Extremely similar	<u>13</u> Somewhat similar	<u>4</u> Not especially similar or different	<u>12</u> Somewhat different	<u>3</u> Extremely different
e. How realistic was the exercise in representing an actual organizational decision process?	<u>1</u> Very realistic	<u>17</u> More realistic than not	<u>13</u> Had equally unrealistic and realistic aspects	<u>4</u> More unrealistic than not	<u>0</u> Very unrealistic
f. How much did the \$25 reward impact on your behavior?	<u>7</u> Very significant impact	<u>14</u> Significant impact	<u>9</u> Moderate impact	<u>5</u> Relatively small impact	<u>0</u> No impact at all
g. Would you have acted differently if the reward were greater?	<u>8</u> Very definitely	<u>8</u> Most likely	<u>5</u> I am unsure	<u>11</u> Unlikely	<u>3</u> Definitely not
h. Would you have acted differently if the reward were smaller?	<u>2</u> Very definitely	<u>15</u> Most likely	<u>3</u> I am unsure	<u>15</u> Unlikely	<u>0</u> Definitely not

a. $\bar{X} = 1.371$
S.d. = .770

b. $\bar{X} = 2.543$
S.d. = 1.358

c. $\bar{X} = 2.629$
S.d. = .808

d. $\bar{X} = 2.971$
S.d. = 1.200

e. $\bar{X} = 2.571$
S.d. = .739

f. $\bar{X} = 2.343$
S.d. = .968

g. $\bar{X} = 2.800$
S.d. = 1.346

h. $\bar{X} = 2.89$
S.d. = 1.057

COMPETITIVE TREATMENT

a. Did the way you were rewarded encourage people to take a competitive attitude toward one another?	<u>22</u> Very definitely	<u>8</u> Somewhat	<u>0</u> I am unsure	<u>2</u> Probably not	<u>0</u> definitely not
b. Did the way you were rewarded encourage people to take a cooperative attitude toward one another?	<u>3</u> Very definitely	<u>7</u> Somewhat	<u>2</u> I am unsure	<u>14</u> Probably not	<u>6</u> definitely not
c. Do you think the point system primarily encourage you to:	<u>8</u> Compete aggressively	<u>14</u> Compete somewhat	<u>8</u> Both cooperate and compete	<u>2</u> Cooperate somewhat	<u>0</u> Cooperate a great deal
d. How similar or different were the various vendors?	<u>0</u> Extremely similar	<u>16</u> Somewhat similar	<u>0</u> Not especially similar or different	<u>14</u> Somewhat different	<u>2</u> Extremely different
e. How realistic was the exercise in representing an actual organizational decision process?	<u>3</u> Very realistic	<u>15</u> More realistic than not	<u>9</u> Had equally unrealistic and realistic aspects	<u>3</u> More unrealistic than not	<u>2</u> Very unrealistic
f. How much did the \$25 reward impact on your behavior?	<u>5</u> Very significant impact	<u>2</u> Significant impact	<u>12</u> Moderate impact	<u>10</u> Relatively small impact	<u>3</u> No impact at all
g. Would you have acted differently if the reward were greater?	<u>3</u> Very definitely	<u>10</u> Most likely	<u>7</u> I am unsure	<u>5</u> Unlikely	<u>7</u> Definitely not
h. Would you have acted differently if the reward were smaller?	<u>3</u> Very definitely	<u>2</u> Most likely	<u>7</u> I am unsure	<u>11</u> Unlikely	<u>9</u> Definitely not

a. $\bar{X} = 1.438$
S.d. = .801

b. $\bar{X} = 3.406$
S.d. = 1.292

c. $\bar{X} = 2.125$
S.d. = .871

d. $\bar{X} = 3.063$
S.d. = 1.105

e. $\bar{X} = 2.563$
S.d. = 1.014

f. $\bar{X} = 3.125$
S.d. = 1.185

g. $\bar{X} = 3.094$
S.d. = 1.329

h. $\bar{X} = 3.656$
S.d. = 1.234

COOPERATIVE TREATMENT

a. Did the way you were rewarded encourage people to take a competitive attitude toward one another?	<u>1</u> Very definitely	<u>4</u> Somewhat	<u>1</u> I am unsure	<u>7</u> Probably not	<u>20</u> definitely not
b. Did the way you were rewarded encourage people to take a cooperative attitude toward one another?	<u>26</u> Very definitely	<u>2</u> Somewhat	<u>2</u> I am unsure	<u>3</u> Probably not	<u>0</u> definitely not
c. Do you think the point system primarily encourage you to:	<u>0</u> Compete aggressively	<u>2</u> Compete somewhat	<u>6</u> Both cooperate and compete	<u>2</u> Cooperate somewhat	<u>23</u> Cooperate a great deal
d. How similar or different were the various vendors?	<u>0</u> Extremely similar	<u>10</u> Somewhat similar	<u>9</u> Not especially similar or different	<u>12</u> Somewhat different	<u>2</u> Extremely different
e. How realistic was the exercise in representing an actual organizational decision process?	<u>8</u> Very realistic	<u>14</u> More realistic than not	<u>6</u> Had equally unrealistic and realistic aspects	<u>5</u> More unrealistic than not	<u>0</u> Very unrealistic
f. How much did the \$25 reward impact on your behavior?	<u>3</u> Very significant impact	<u>10</u> Significant impact	<u>12</u> Moderate impact	<u>3</u> Relatively small impact	<u>5</u> No impact at all
g. Would you have acted differently if the reward were greater?	<u>3</u> Very definitely	<u>5</u> Most likely	<u>8</u> I am unsure	<u>10</u> Unlikely	<u>7</u> Definitely not
h. Would you have acted differently if the reward were smaller?	<u>1</u> Very definitely	<u>7</u> Most likely	<u>2</u> I am unsure	<u>10</u> Unlikely	<u>13</u> Definitely not

a. $\bar{X} = 4.242$
S.d. = 1.173

b. $\bar{X} = 1.455$
S.d. = .971

c. $\bar{X} = 4.394$
S.d. = .998

d. $\bar{X} = 3.182$
S.d. = .950

e. $\bar{X} = 2.242$
S.d. = 1.001

f. $\bar{X} = 2.909$
S.d. = 1.182

g. $\bar{X} = 3.394$
S.d. = 1.248

h. $\bar{X} = 3.818$
S.d. = 1.261

APPENDIX 8:
PEARSON CORRELATION COEFFICIENTS
FOR EACH DEPENDENT VARIABLE WITH
EACH INDEPENDENT VARIABLE

Pearson Correlation Coefficients for Each
Dependent Variable with Each
Independent Variable

	<u>dependent variables</u>		
	<u>Perceived Conflict**</u>	<u>Norton Coalition Measure</u>	<u>Vote Coalition Measure</u>
<u>independent variables</u>			
Competitive Reward System*	r=-.68 p=.001	r=.12 p=.22	r=-.71 p=.001
Cooperative Reward System*	r=.86 p=.001	r=-.63 p=.001	r=.59 p=.001
Independent Reward System*	r=-.17 p=.12	r=.52 p=.001	r=.11 p=.23

	<u>mean</u>	<u>standard deviation</u>
perceived conflict	32.47	7.78
norton coalition measure	2.42	1.08
vote coalition measure	4.71	.99

key: r = correlation coefficient
p = level of significance

* The reward systems were coded as 0,1 variables for the purpose of this analysis

** Higher scores on the perceived conflict scale represent lower levels of perceived conflict

APPENDIX 9:
A NOTE ON THE USE OF MULTIDIMENSIONAL
SCALING AS A POTENTIAL TECHNIQUE
FOR IDENTIFYING COALITIONS

A novel and potentially valuable approach to identifying coalitions can be achieved by applying multidimensional scaling (MDS) to the data provided by the Norton measure. In this manner, further insight might be gained concerning coalitional arrangements within the context of the overall buying group structure. Multidimensional scaling is "a set of techniques for transforming distance-like input data into coordinate representations of the points in a (typically Euclidean) space of low dimensionality" (Green, 1978, p.412). It provides a spatial representation or map of products or some other object of interest based on respondent perceptions of similarity and/or preference for those objects. This statistical procedure is typically applied to products, models, or firms. However, it can be applied to people and their perceptions of others in a group.

The potential of this technique can be demonstrated by examining the first, second, and third decisions made by buying center #1 in the competitive treatment. Matrices were constructed of work attraction units for every dyad in each buying center. The matrices for buying center #1 in the competitive treatment are found on the following page, and these were the MDS input. The dyadic scores are based on preference data, where each buying group member indicated the persons with whom they worked the most closely (3 points), the second most closely (2 points), and the third most closely (1 point). Those group members not ranked by

Matrices of Work Attraction
Units for Each Dyad in Buying
Center #1 During Each of the
Purchasing Decisions
(Competitive Treatment)

	Purchasing	Engineering	Marketing	Maintenance	Finance	Production	Q. C.	
Purchasing	-	0	3	0	4	0	1	
Engineering		-	0	5	1	2	3	
Marketing			-	0	6	2	2	
Maintenance				-	0	5	2	PURCHASING
Finance					-	0	4	DECISION #1
Production						-	0	
Quality Control							-	

	Purchasing	Engineering	Marketing	Maintenance	Finance	Production	Q. C.	
Purchasing	-	0	3	1	2	0	0	
Engineering		-	0	1	3	2	4	
Marketing			-	4	6	4	0	
Maintenance				-	1	0	4	PURCHASING
Finance					-	1	5	DECISION #2
Production						-	0	
Quality Control							-	

	Purchasing	Engineering	Marketing	Maintenance	Finance	Production	Q. C.	
Purchasing	-	0	4	0	2	2	1	
Engineering		-	0	6	1	3	5	
Marketing			-	1	6	4	2	
Maintenance				-	0	0	4	PURCHASING
Finance					-	2	0	DECISION #3
Production						-	0	
Quality Control							-	

a given subject received zero points. Totals for all possible dyads were calculated, resulting in a score ranging from six (a pair that worked most closely together) to zero (a pair that did not work at all closely together).

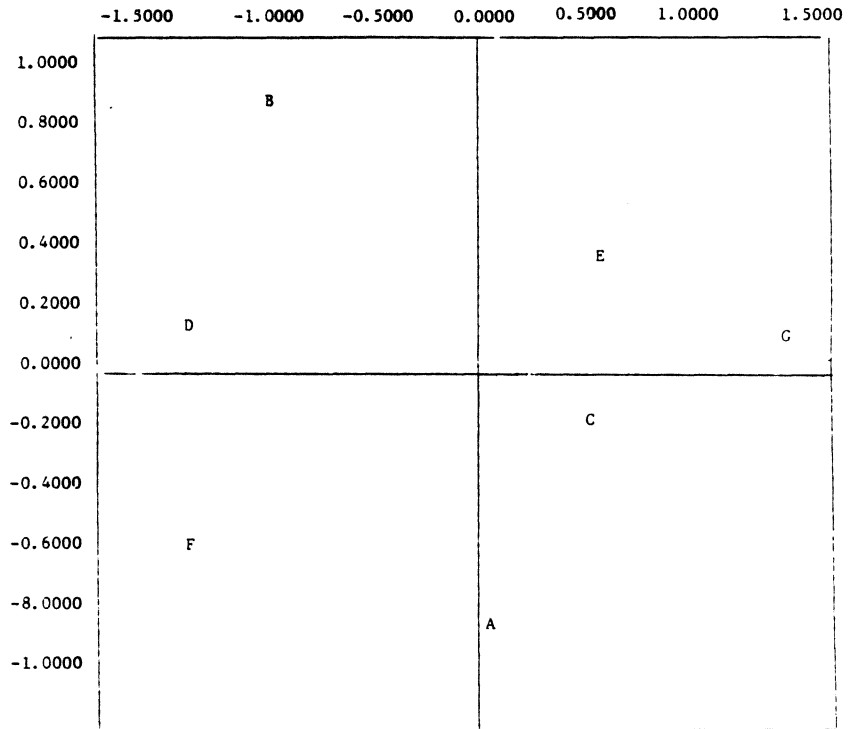
The objective here is not to label the dimensions, but only to obtain a spatial representation of buying group structure in terms of distances between individuals. Green (1979,p.421) explains, "One need not necessarily be concerned with dimensional representations or psychological interpretations of the space; MDS (can be) strictly used as a way to heighten certain associations in the data."

The analysis uses the TORSCA non-metric MDS procedure found in KYST, a program developed by Bell Laboratories. In this instance, the input data are ordinal, while the output distances are metric. The program attempts to produce configurations or maps "whose rank orders of estimated ratio-scaled distances between all stimuli best reproduce the input rank orders" (Hair, et al., 1979, p.298). The analyst is trying to generate a spatial map with the fewest number of dimensions while attaining an acceptable measure of stress. That is, a trade-off is involved. The stress measure is an indicator of how well the ranked distances generated by MDS correspond with the input data. The closer this value is to zero, the better the fit.

The resulting maps are found on the following pages. In each case, two dimensions were generated, with associated stress values of .009 (decision #1), .043 (decision #2), and .046 (decision #3). Each of these would appear to be acceptable fits. As can be seen,

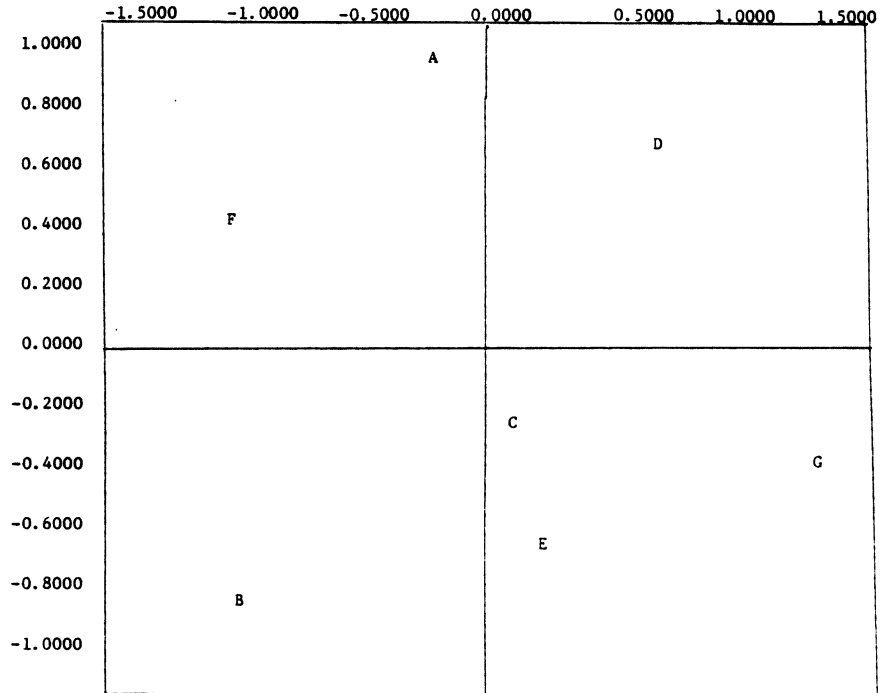
there is a consistency across decisions in terms of group structure. This may corroborate the finding of no effect due to repeated measures in the ANOVA results. It appears that two subsets of subjects arose within the overall structure. One subset includes subjects E, C, and G, while the other consists of D, F, and A. These might be interpreted as coalitional groupings. The E-C-G and D-F-A sub-groupings, and the relative isolation of B, are consistent across decisions.

This discussion has not endeavored to be an exhaustive treatment of the potentialities of MDS in the analysis of group structure. Rather, the positive nature of these results suggest that MDS holds promise as a methodological approach for analyzing coalitions.



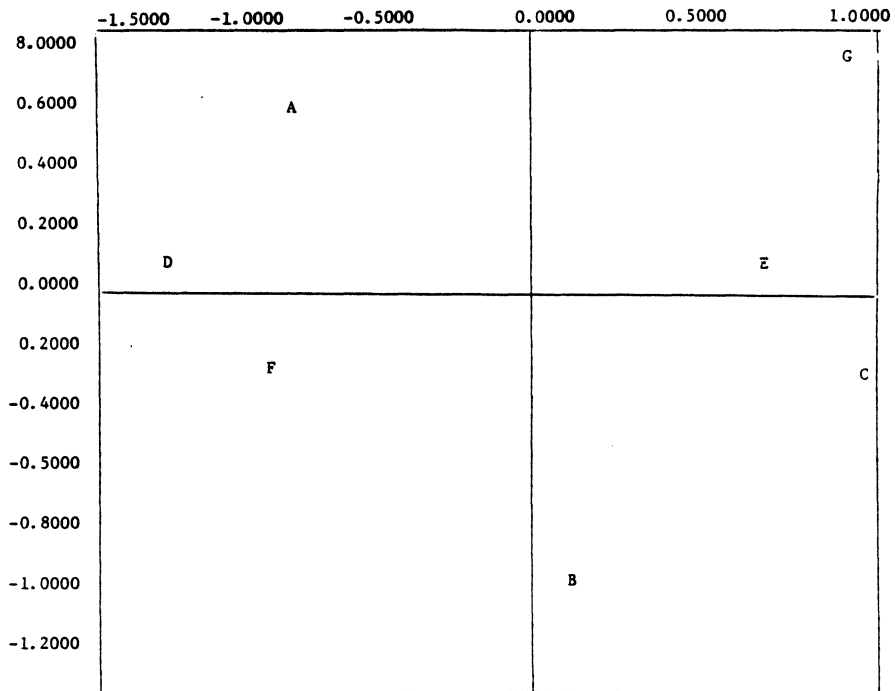
A = quality control
 B = production
 C = finance
 D = maintenance
 E = marketing
 F = engineering
 G = purchasing

Configuration Plot using Multidimensional Scaling for Buying Center #1, Decision #1, in the Competitive Treatment



A = quality control
 B = production
 C = finance
 D = maintenance
 E = marketing
 F = engineering
 G = purchasing

Configuration Plot using Multidimensional Scaling for Buying Center #1, Decision #2, in the Competitive Treatment



A = quality control
 B = production
 C = finance
 D = maintenance
 E = marketing
 F = engineering
 G = purchasing

Configuration Plot using Multidimensional Scaling for Buying Center #1, Decision #3, in the Competitive Treatment

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