The Effect of Group Influence on Organizational Buying

by

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Dissertation submitted to the Faculty of the
Virginia Polytechnic Institute and State University
in partial fulfillment of the requirements for the degree of
Doctor of Philosophy

in

Business Marketing

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April, 1994

Blacksburg, Virginia

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(ABSTRACT)

This research explores the process by which individual buying decisions are modified as a result of group discussion to arrive at a buying center decision. Existing evidence shows that, in some cases, group decisions are more cautious than those of individuals while in other situations they are more risky. The objective of this paper is to examine how individual buying center member choices are formed, how these choices and preferences are influenced by group discussion, and how the purchase decision context influences the riskiness of individual versus group purchasing discussions.

One of the key concepts from prospect theory that guides an individual buying decision is the decision frame. However, little is known about how the decision frame of multiple individuals coming together to discuss a decision issue affects the group's overall decision. This research develops a model which describes (1) how an organizational

buyer's individual choice is formed, (2) how the influence processes that transpire during buying center discussion changes those choices resulting in a different buying center choice, and (3) explores how the purchasing context may impact these processes.

The model was tested in two controlled laboratory experiments in which 256 undergraduate business students made supplier selection decisions both individually and in groups based on information contained in four hypothetical procurement scenarios. The results were analyzed using a partially confounded experimental analysis of variance procedure and a series of t tests which tend to provide support for the model.

Specifically, the findings suggest that the decision frame used by individual buyers combined with group influence affects buying center choices. However, contrary to the predictions offered by prospect theory, when decision were framed as a gain, buyers selected the risky supplier and when decisions were framed as a loss, buyers selected the cautious supplier.

For this study, no evidence was found to support the notion that group discussion intensifies the effect of the decision frame. Finally, whether the procurement is goods- or service-based seems to impact the effect of influence on the polarization of the buying centers choice.

Acknowledgments

This research owes a great deal to many people, but special thanks are owed to the members of my committee whose names appear at the front of this document: Edward F. Fern, Janet E. Keith, James R. Brown, George R. Franke, and Rosanne J. Foti. As a committee, they have provided me the guidance and counsel that made doing this research a genuine pleasure. Of greater importance however, was the support and encouragement that they provided to me during my earlier years in the doctoral program. Without their support, I may have never reached this stage in my career. For this, I am extremely grateful.

An additional thanks is due to Noreen Klein who spent many hours assisting in the conceptual development of this dissertation. She had no other vested interest in this work other than the intellectual stimulation that is one of the greatest driving forces in her life. Thank you very much for your help Noreen.

Special thanks are also due to the Statistics Department at Virginia Polytechnic Institute and State University and especially Claus Hinkleman and Shankar Srinivasan who assisted me greatly in the research design and analysis stages of this research.

Finally, to my wife and son who provided me support to persist in achieving this goal, I love you very much.

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CHAPTER 1

INTRODUCTION

In order to maximize the sales of its products or services, a firm must develop an effective marketing strategy. The development of a marketing strategy involves the selection of a target market and the adjustment of the variables under the firms control (i.e., product, price, promotion, and channel variables). In the most general terms, the firm could choose to serve either an organizational market or a consumer market. The firm choosing to serve an organizational market would like to have knowledge of likely buyer responses to various levels of the firms controllable variables. Therefore, understanding organizational buying behavior is an important component of marketing knowledge.

This dissertation reports the results of research that was conducted to explore differences in supplier choices made by individual organizational buyers and those made by buying groups. The main thesis is that the existence of a buying group will cause organizational buying choices to change in predictable ways. Knowledge of how the individual procurement decision process is altered as a result of group influence is useful to marketers seeking to adjust their promotional strategies to more effectively tailor their selling

efforts to maximize the sales of the firms offerings. This chapter is organized in the following manner. The first section presents an overview of organizational buying behavior. The second section explains the purpose of the research. The third section introduces the central concepts of the study. The fourth section presents an overview of the study. The fifth section summarizes the significance of the study, and the final section is an outline of the dissertation.

Overview Of Organizational Buying Behavior

Organizational buying is unique because of its complexity and the process by which organizations buy. This section will discuss the distinctive nature of organizational buying, the process by which organizations buy, the buyers functions during the procurement process, and the composition of the buying center.

The Complexity of Organizational Buying

Organizational buying is more complex than consumer buying for several reasons (Webster and Wind 1972). First, more people are involved, each playing different roles in the purchase, and these people are likely to vary from one purchase situation to the next. This has given rise to the concept of the buying center which identifies the individuals involved in the purchase as buyers, deciders, influencers, users, and gatekeepers. Buyers select the

supplier and arrange purchase terms, deciders have power to determine the final selection of suppliers, influencers affect buying or usage decisions, users operate or utilize the products or services under consideration, and gatekeepers control the flow of information into the group.

Second, organizational procurements tend to be more technologically complex than consumer purchases. Therefore, a large amount of factual information is required for the purchase decision. In addition, these purchases often require the opinions of those who can best predict future technology changes.

Third, organizational purchases often take longer to make than consumer purchases. The technical complexity often involved in these decisions requires more information, longer evaluation time, more uncertainty, more money, and increased dependence on the supplier for long term relationships. The increased time necessary to make an organizational buying decision results in a larger time lag between marketing effort and buyer response.

Finally, the organization itself can be an important influence on buying behavior. Each individual organization has its own policies and procedures regarding the purchasing function. In addition, each organization has unique competencies derived from its personnel. Furthermore, monetary resources vary by organization. Webster and Wind (1972)

feel that individual organizations may be so different that it may be best to view each as a separate market segment.

The Organizational Buying Process.

Organizational buying is a complex decision process where a firm attempts to find a solution to a problem through the purchase of a product or a service. Generally, this process involves the identification of a need, establishing buying objectives and specifications, identifying buying alternatives, evaluating alternative buying actions, and selecting the supplier (Webster and Wind 1972). Multiple individuals in an organization are likely to play a role at each stage of the buying process.

In many situations, potential users of a product or service are those who initiate the buying process (e.g., production personnel). In other situations, technical personnel (i.e., influencers) such as those involved in the development of new products may initiate the buying process.

The individuals who originally defined the buying need may also be involved in the establishment of buying specifications. In addition, potential users, research and development personnel, buyers, and design and production engineering may influence product or service specifications.

Gatekeepers primarily exert their influence at the stage of identifying buying alternatives. Buyers are also likely to play a large role in determining the set of feasi-

ble suppliers. However, users and influencers can exert their influence by defining criteria which constrains the buyers choices.

Users, influencers, and buyers are primarily responsible for the evaluation of alternative suppliers. Users such as labor unions may influence the evaluation of alternative suppliers by refusing to work with products of certain, non union suppliers. Influencers such as engineers play a role in supplier evaluation by providing information with which to evaluate alternative suppliers. Finally, users, influencers, buyers, and deciders may all have input into the final supplier selection decision. Table 1-1 summarizes the buying center roles likely to have input at each stage of the organizational buying process.

The Buyers Functions

The buyer in a formal organization is normally responsible for six functions (Webster and Wind 1972). Buyers usually (1) negotiate prices and other contract terms with vendors, (2) assist in generating alternative solutions to the buying problem and keep organizational members informed of market conditions, (3) protect the organizations cost structure as it is influenced by prices paid for purchased products, (4) are responsible for maintaining long term assurances of supply, (5) are responsible for maintaining good relationships with suppliers, and (6) manage the procurement pro-

cess.

Table 1-1
Decision Stages and Roles in the Buying Center
Source: Webster and Wind (1972)

	User	Influ-encer	Buyer	Decider	Gate-keeper
Identify Need	X	X			
Establish Specifica-tions.	X	X	X	X	
Identify Alternatives	X	X	X		X
Evaluate Alternatives	X	X	X		
Select Supplier	X	X	X	X	

As can be seen, the buyers role in the procurement process is somewhat limited in a formal organization. For example, buyers are not likely to be influential in setting procurement specifications. This role varies however, depending on the size of the organization and the nature of the buying task. Generally, the smaller the organizations size, the more responsibility the buyer has in decision making at each stage of the buying process. Also, routine purchases may be made entirely by the buyer, while new product or service procurements are likely to be made jointly with other members of the organization (Hutt and Speh

1981).

Composition of the Buying Center

The composition of the buying center varies according to the buying situation (Webster and Wind 1972). The larger the expenditure and the more critical the buying decision to the total operation of the organization, the more likely that top management personnel will be involved in the buying center. If the product or service offered by the organization is likely to be influenced by the suppliers products or services, then sales and marketing people are likely to be involved. If capital expenditures are involved, then financial executives will have an influence. Finally, if the purchased materials are used in the production process, then design engineering and manufacturing personnel will be included in the buying center. The following section will discuss the questions that guided this research.

Purpose of the Research

The buying process in a formal organization usually involves several people (i.e., the buying center). These individuals interact on the basis of their particular roles in the organization (i.e., influencers, users, deciders, buyers, and gatekeepers). The interaction of these individuals is guided by a shared set of objectives, norms, and expectations. The communication that transpires during the procurement decision process results in interpersonal influ-

ence that bears on the purchase decision. This interpersonal influence can be thought of as group influence.

The major philosophy behind the buying center concept is that multiple viewpoints and a wider range of experience and expertise are brought to the purchase problem (Hutt 1979). Presumably, this range of experience reduces decision-related uncertainty and lowers the risk of making a poor supplier choice.

While it may be true that organizational buyers utilize objective facts in considering their choice, business buying decisions are not simply logical, rational acts. Organizational members are not purely "economic men" nor are they purely "emotional and irrational" (Webster and Wind 1972). A recent article by Sherlok (1992) highlighted personal and social (i.e., group) factors that enter into the decision. Personal factors which may have the most important influences on purchase decisions are attitudes, prejudices, and deep-seated emotions (Sherlok 1992). Webster and Wind (1972) identified group influence as being one of the most important factors impinging on organizational buying decisions. Social factors that may influence the purchase decision include: social facilitation; social loafing; deindividuation; group think; minority influence; and group polarization (Myers 1990).

Social facilitation occurs when an individual's per-

formance on a task is boosted by the mere presence of others. Social loafing occurs when people exert less individual effort, when their effort is pooled with others toward a common goal, and they are not individually evaluated. Deindividuation occurs when individuals see themselves as a part of a group rather than an individuals, causing them to be less concerned with the consequences of their actions. Groupthink occurs when individuals engage in consensus seeking during group discussion, preventing them from considering more realistic alternatives. Minority influence occurs when certain group members motivate and guide the group. Finally, group polarization is an enhancement of members' preexisting tendencies, caused by group discussion.

This research focused on group polarization as one of the important social factors that influences the final purchase decision of the buying center. Much of the recent research on organizational buying behavior has focused on the effect of individual factors on purchase choice. Most recent is the work on the effect of decision frame on purchase choice (e.g., Qualls and Puto 1989, Puto 1987, Puto 1985). These findings suggest that decisions cast in a favorable light tend to result in more conservative supplier choices, while those cast in a negative light tend to elicit less conservative supplier choices. However, this work neglected the fact that many organizational buying decisions

are made by multiple individuals, rather than a single individual. Research which accounts for a "group effect" would add insight to our knowledge of organizational buying behavior.

This research took advantage of the recent findings regarding the effect of decision frame on individual buyer choice and introduced the group as an additional variable for consideration. More specifically, the supplier choices made by individual buyers under different decision frames were compared with those of a buying center under the same decision frame. Specific questions that were addressed included: (1) "Does the decision frame used by a buyer to evaluate alternative suppliers affect the individual buyer's choice or preferences for a supplier?" (2) "Do buying center member's choices or preferences become more cautious as a result of buying center discussion about procurement decisions that are framed as gains?" (3) "Do buying center member's choices or preferences become more less cautious as a result of group interaction about procurement decisions that are framed as losses?" (4) "Is there a difference in the choices or preferences of buyers to a specific decision frame and group influence type resulting from the procurement being goods- or service-based?" The following section will present a conceptual overview of the theoretical ideas employed in this research.

Conceptual Overview

Group polarization occurs when individuals who have the same opinion regarding the solution to a problem get together and discuss it. When asked to make one overall group choice, the common finding is that the group choice is in the same direction as, but more extreme than the average individual opinion prior to the group discussion (see Isenberg (1987) for a review). The direction of polarization of the group's attitudes depends on the individual's initial predispositions. A predisposition toward a cautious choice alternative results in a more conservative group choice, while a predisposition toward a risky choice alternative results in a riskier group choice.

The most popular explanation of an individual's initial predisposition toward either risk or caution is prospect theory (Kahneman and Tversky 1979). According to prospect theory, individuals evaluate choice alternatives as either gains or losses with respect to an initial reference point. Individual choices will tend to be cautious (i.e., risk-averse) for decisions cast in a favorable light (i.e., gains) and less cautious (i.e., risk-seeking) for decisions cast in an unfavorable light (i.e., losses).

In organizational buying, the combination of a difficult to achieve initial reference point (e.g., tight budgets or short lead times) with poor choice alternatives (e.g.,

choices among suppliers offering high prices or slow order cycle times) may result in a loss decision frame (Qualls and Puto 1989, Puto 1985, 1987). On the other hand, the combination of an easy to achieve initial reference point (e.g., liberal budgets or long lead times) and good choice alternatives (e.g., choices among suppliers offering low prices or quick order cycle times) can result in a gain decision frame.

A buyer's initial predisposition toward a risky or cautious supplier is posited to be a function of the buyer's initial reference point and choice alternatives. Organizational buyers who frame decisions as gains are likely to make risk averse (cautious) choices, while buyers who frame decisions as losses are likely to make risk-seeking choices.

Based on these notions, we might expect that a buyer who frames a supplier choice decision as a gain is likely to form a cautious initial predisposition. Given a choice of a risky supplier and a cautious supplier, the buyer would then tend to choose the cautious supplier. Alternatively, a buyer who frames a supplier choice decision as a loss is likely to form a risky initial predisposition. The buyer would then tend to choose the more risky supplier.

Based on findings from polarization studies, we might expect buyers who have the same initial predispositions, say toward caution, who enter into a supplier choice discussion

with other buying center members (with the same decision frame), to produce a group supplier choice that is more cautious than the individual buyers initial predispositions. In this case, the buying center might choose an extremely cautious supplier. Conversely, we might expect buyers who have the same initial predispositions, say toward risk, who enter into a supplier choice discussion with other buying center members (with the same decision frame), to produce a group supplier choice that is more risky than the individual buyers initial predispositions. In this case, the buying center might choose an extremely risky supplier.

The shift of the groups choice toward more extreme risk or caution can be explained by two theories of social influence, normative social influence and informational social influence (Lamm 1988, Myers and Lamm 1976). According to normative social influence theory, individual group members compare their own position on an issue with the positions of other group members. This comparison causes some participants to take more extreme positions (Lamm 1988). Two motivational processes are thought to cause this polarization to more extreme positions, self-presentation and release. Individuals are thought to change positions to project a more favorable image of themselves. The release version proposes that, prior to group discussion, some individuals feel restrained from displaying the more radical positions

that they would ideally have preferred, and by observing of one or more other similar positions being displayed by group members loosens their restraint. This new found freedom allows them to display their preferred position on an issue.

Informational social influence suggests that choice shift may be due to the preponderance of information presented in the predominant group position. This informational perspective suggests that the validity and novelty of arguments presented in the group determine the occurrence and strength of the tendency to polarize (Lamm 1988). As more valid and novel arguments are presented in support of the extreme position, individuals tend to contribute similar arguments in support of the dominant side of the issue. If a sufficient number of these arguments are seen as novel and valid by some group members, then a strengthening of the initial tendency can be expected.

Laughlin and Earley (1982) proposed that many group decisions can be located along a continuum. At one end of the continuum are intellective issues for which there are demonstratably correct answers. At the other end of the continuum are judgemental issues for which there are no demonstratably correct answers. Kaplan and Miller (1978) found that informational influence was the primary cause of choice shift when the issue was intellective, and normative influence was the primary cause of choice shift when the

issue was judgemental.

Since services are thought to be intangible, perishable, heterogeneous, and consumed as they are produced (Berry 1980, Brown and Fern 1981) we might expect that service procurements would be more judgemental in nature, and goods procurements more intellective. Therefore, we might expect that normative influence may be the predominant cause of choice shift for service procurements, and informational influence the predominant cause of choice shift for goods procurements.

The following section will outline the procedure that was followed to test the above assertions.

Overview of the Study

Two separate concurrent laboratory experiments were used to test for the effect of decision frame on an individual buyer's supplier choice and the effect of buying center discussion on buying center choice. One experiment asked subjects to make a goods-based supplier choice, the other experiment asked subjects to make a service-based supplier choice.

Both the service-based and goods-based experiments asked individual subjects to choose among two potential suppliers. One supplier provided a certain bid price, the other supplier a risky bid price, of equal expected value. Both experiments asked subjects to make two supplier choice

decisions, one under a gain frame condition, and the other under a loss frame condition.

After individually making a supplier choice for each purchase scenario, subjects met as a group of four. Each group was instructed to discuss the procurement scenarios among themselves, and make one overall supplier choice in each frame condition. Each group made two supplier choices, one for the gain frame condition and one for the loss frame condition.

Subsequent to making the two group supplier choices, the four individual subjects were again asked to make individual supplier choices. Each individual subject made two supplier choices, one for the gain frame condition and another for the loss frame condition. Subjects were then dismissed from the experiment. The next section will discuss the significance of this research.

Significance of the Study

One of the major contributions made by Webster and Wind (1972) was the development of the concept of the buying center. The recognition that many organizational purchases were made by groups led to three major marketing implications. First, that marketers to organizational customers have to identify the members of the buying center. Second, that they have to determine the roles that each person involved in the purchase for the organization plays in the

final procurement decision. Finally, they need to determine the criteria that each member of the buying center will use to make their procurement decisions. These prescriptions enable the organizational marketer to more accurately target their selling efforts, and tailor their persuasive messages to each member.

Once each buying center member has received their promotional message and collected other pertinent information, they meet as a group to discuss the purchase. Unfortunately, little is known about what transpires as a result of the mutual influence that takes place during the group discussion. Social psychologists have found several group influences that could operate during buying center interaction (i.e., social facilitation, social loafing, de-individuation, groupthink, minority influence, and group polarization). It seems possible that some of these influences could operate in the context of organizational buying as well.

This research was conducted as a first step in determining the effect of group processes on organizational buying decisions. However, there are many other substantive areas within marketing where these social factors could operate. These include forecasting, new product development, negotiation and bargaining, selling teams, and family decision making among others.

From a conceptual perspective, examining the effect of informational social influence or normative social influence in an organizational buying context allows for the determination of the breadth of theoretical coverage. If the effect of normative or informational influence is shown to exist, these theories will become more general in their application. If no effect is found, perhaps the theoretical limit or boundary of application has been crossed. The final section will discuss the outline of this dissertation.

Outline of the Dissertation

The research just described is organized in the following manner. Chapter 2 provides a review of organizational buying, behavioral decision theory and theories of group behavior that are used to develop a conceptual model of the buying center choice and preference process as it might apply to supplier selection decisions made by buying centers.

The literature review chapter includes: (1) a summary of the marketing literature regarding individual versus group organizational buying under risk; (2) a brief explanation of the risky-shift phenomenon; (3) a description of the group polarization hypothesis; (4) a review of the prominent theories used to explain group polarization; and (5) a review of the commonly accepted theories of individual decision making under risk (i.e., expected utility theory

and prospect theory) in order to provide the necessary background for theoretical development.

A conceptual model was developed in Chapter 3 which suggests the several research hypotheses that were tested. The objectives of the theoretical development chapter were to: (1) integrate prospect theory with theories of social influence, polarization and findings from organizational buying research to explain and predict buying center preferences; (2) develop a conceptual model of buying center choice based on this conceptual integration; and (3) provide a set of testable hypotheses relating to the conceptual model.

The research methodology, Chapter 4 describes the research design and the procedures that were used in collecting the data gathered during the experiment. The design section includes a discussion of the procedure, experimental factors, the stimuli, and the measures used in the study. The procedures section includes a discussion of the subjects, and sample size that will be used in data collection.

Chapter 6 describes the analysis of variance procedure that was be used in presenting and testing the hypotheses. The results are then reported and discussed in Chapter 7, with respect to their contribution to knowledge and the research questions outlined above.

Summary

In summary, organizational buying is unique in its complexity. Frequently, the organizational buying process involves many people, playing different roles, at different stages of the buying process. The purpose of this research was to explore whether or not decision framing has an effect on individual supplier choice and if group polarization caused these choices to become more extreme in a group.

The ultimate objective of this research is to achieve a better understanding of how individuals combine their opinions and preferences on supplier selection issues to arrive at an overall buying center choice.

CHAPTER 2

LITERATURE REVIEW

Chapter two reviews the literature that will be drawn upon for the conceptual development chapter. The literature review includes: (1) a summary of the marketing literature on organizational buying outlining the conditions precipitating group buying, and the research on group buying; (2) a discussion of an anomalous finding unique to groups called the risky-shift phenomenon; (3) a generalization of the risky-shift phenomenon into the group polarization hypothesis; (4) a review of the theories of social influence used to explain group polarization; and (5) the commonly accepted theories of individual decision making under risk.

One objective of the review was to identify knowledge gaps in organizational buying research pertaining to buying centers. Another objective was to integrate knowledge from other disciplines with organizational buying, thereby beginning to fill the gap identified.

During this review, conclusions will be drawn concerning the present state of knowledge in each area, as well as what work needs to be done in each area. The following section discusses the circumstances that are likely to result in buying groups rather than individual buyers making organizational purchase decisions.

Individual Versus Group Decisions in Organizational Buying

This section will review two streams of research in organizational buying that have relevance for the aforementioned research questions. The first stream of research deals with the question "When is group rather than individual decision making employed in organizational buying?" After identifying the situations under which *group* decision making in organizations is likely to occur, the next question, "What is the relative influence of the individuals in the buying group participating in the decision making process?" is reviewed. These two streams of research correspond to two major conceptual constructs identified by Silk and Kalwani (1982) as participation and influence. Participation deals with "who was involved" in one facet or another of the overall buying decision process and influence pertains to "how much say" someone had in the outcome of the buying decision process (Silk and Kalwani 1982). The section will begin with a review of buying center participation.

Participation

One characteristic of the purchasing task that is believed to be related to whether an individual buyer or a buying center makes a procurement decision for the firm is the perceived risk of the purchase situation (Sheth 1973). Marketing texts commonly state that buying centers rather

than individual buyers make purchase decisions when the buying task is complex. Webster and Wind (1972) proposed that the technical complexity often involved in these decisions requires more information, longer evaluation time, more uncertainty, more money, and increased dependence on the supplier for long term relationships. It logically follows that additional personnel assisting in the buying decision could bring expertise and information to the purchase decision, which may reduce decision uncertainty.

Hutt and Speh (1981) propose that one factor that determines whether a specific buying situation will be a group or an individual decision is perceived risk. The higher the level of perceived risk in a buying situation, the greater the likelihood that the decision will be made by a group. The following section discusses the concept of perceived risk, and the rationale for group decisions when perceived risk is high.

Perceived Risk. Perceived risk refers to the magnitude of aversive consequences felt by the decision maker if he or she makes a poor choice, and the uncertainty under which the decision must be undertaken (Sheth 1973, Webster and Wind 1972). Conceptually, the interaction between decision-related uncertainty and aversive consequences results in the level of perceived risk felt by the buyer. For example, if decision uncertainty is high but the aversive consequences

associated with the decision are low, perceived risk is likely to be low. Conversely, if the aversive consequences are high but uncertainty is low, perceived risk is likely to be low. Therefore, the buyer is motivated to reduce either decision-related uncertainty or the aversive consequences associated with the decision in order to reduce perceived risk.

Two types of consequences are important determinants of the amount of perceived risk perceived by the buyer, performance uncertainty and psychological uncertainty (Webster and Wind 1872). Performance uncertainty is the likelihood that a vendor or product will not perform satisfactorily. Psychological uncertainty is the likelihood that other members in the organization will view the decision negatively (Hutt and Speh 1981, Webster and Wind 1972).

One strategy a buyer can peruse to reduce uncertainty is acquiring additional information (Webster and Wind 1972). Information acquired from other's within the firm can reduce both psychological uncertainty and performance uncertainty. Psychological uncertainty may be reduced by allowing the buyer to take into account other organizational member's opinions and preferences when the purchase decision is made. Performance uncertainty may be reduced when the buyer gains insight from other organizational member's who have expertise in specific areas. Information acquired outside the

firm also reduces performance uncertainty, such as when the buyer conducts reference checks on a potential supplier's.

Buyers may also reduce perceived risk by reducing the aversive consequences associated with making a poor choice (Webster and Wind 1972). For example, the buyer might reduce the firm's financial investment. However, in many circumstances this option may not be feasible. The procurement of certain product classes may prevent the buyer from reducing the magnitude of aversive consequences associated with making a poor supplier choice. For instance, the purchase of major capital is likely to be a very important, complex, and expensive purchase decision for the firm independent of which supplier is selected. In cases like this it may be unlikely that the buyer would have the ability to reduce the magnitude of aversive consequences of making a poor supplier choice.

Assuming that the buyer can not reduce the magnitude of aversive consequences, the reduction of performance and psychological uncertainty in the purchase of important, complex, and expensive products may be the most significant means of reducing the perceived risk of the buying situation. In this case, the buyer could collect additional information both within and outside of the firm. The participation of other organizational personnel in the purchase decision making process is referred to as the buying center.

In summary, the importance, complexity and cost of a purchase may be directly related to the level perceived risk associated with a purchase. Assuming the buyer can not reduce the magnitude of aversive consequences of making a poor supplier choice to any great extent, the buyer may reduce uncertainty through information acquisition both within and outside of the firm. In turn, uncertainty could be reduced resulting in lower perceived risk.

The foregoing discussion suggests that the importance, complexity and cost of a purchase may be directly related to the level perceived risk associated with a purchase. If perceived risk is high and aversive consequences of making a poor supplier choice cannot be mitigated, a buyer may be motivated to reduce perceived risk through information acquisition. Here, other personnel within the organization might be consulted for their expertise. Those organizational members who have input into the purchase decision process are the buying center. The following section reviews the research findings that support these assertions.

Empirical Evidence. In a study exploring the relationship between environmental uncertainty and buying group structure, Spekman and Stern (1979) found support for a relationship between environmental uncertainty and participation in decision making as well as division of labor. More specifically, they found that as environmental uncertainty in-

creased, more buying group members were likely to be involved in purchasing related decisions, and purchasing-related activities were more likely to be shared by buying group members.

Johnson and Bonoma (1981) explored the relationships between organizational structure and purchase situation variables on several buying center dimensions including extensivity, lateral involvement, vertical involvement, connectedness, and centrality of the purchasing manager in the purchase decision. Regarding extensivity (i.e., the total number of people involved in the decision), they found that more people were involved in the purchase decision when the organization was more formalized, when the purchase was more important and complex, and that capital procurements had more people involved in the purchase decision than service procurements. For lateral involvement (i.e., the number of departments involved in the decision), they found that more departments were involved in the purchase decision in more formal organizations, and when the purchase was more important and novel. For vertical involvement (i.e., the number of hierarchical levels involved in the decision), the number of levels in the organization involved in the purchase decision was positively related to the complexity (i.e., degree of functional specialization), the importance of the purchase, the complexity of the purchase, and higher

levels of vertical involvement were found for capital equipment purchases than service purchases.

In research exploring the effect of perceived personal consequences on participation in organizational decision making, McQuiston and Dickson (1991) found that the perception of personal consequences had a significant, positive relationship on participation in the decision process. The more respondents perceived that they would be blamed for a poor decision or praised for a good decision, the greater their participation in the decision process.

Other researchers have related the number of people involved in the procurement process with organizational buyclasses developed by Robinson, Faris, and Wind (1967). The Robinson, Faris, and Wind (1967) model of industrial purchases incorporates three dimensions: (1) how much information the buyer must gather to make a good decision; (2) the seriousness with which the buyer considers all possible alternatives; and, (3) how unfamiliar the purchase is to the buyer. If the problem is new, the information requirements are high and the consideration of alternatives is important, the buyclass is defined as a new task. Conversely, if the problem is not new, information requirements are low and no new alternatives are being considered, the buyclass is defined as a straight rebuy.

New task buys are characterized as high risk buying

situations while straight rebuys are low risk buy situations. New task buys imply more risk in the decision because buying center members are largely unfamiliar with the with the task and they face a greater level of uncertainty (Wilson, Lilien and Wilson 1991). For new task buys, the buying center tends to be large, the purchasing agent has a minor role, and the engineering representative has a major role in the purchase decision.

On the other hand, straight rebuys are routine, low risk situations where the purchasing agent plays a major role and others have minor or no roles (i.e., the buying center is small) (Anderson, Chu, and Weitz 1987; Robinson, Faris, and Wind 1967).

Anderson, Chu, and Weitz (1987) designed two studies to ascertain how well buy class categories describe industrial purchase behavior. In the model development study, using a sample of sales managers, they found that the more frequently salesforces confronted novel purchase situations where the buyer needed to gather more information, more people were involved in the buying decision. In addition, when buyers considered many alternatives, more people were involved in the buying decision. These findings were replicated in a second study also using sales managers as the sample.

Using a modeling perspective, Wilson, Lilien, and

Wilson (1991) found that single members of the buying center were designated as the decision maker when perceived risk was low. They also found that group choice models were most appropriate when perceived risk was moderate or high.

In summary, conceptually we would expect procurement decisions to be made by a buying group when the perceived risk of the purchase is high. Empirically, research has shown that the size of the buying center is likely to be larger when environmental uncertainty is high, when the importance and complexity of the purchase is great, when personal consequences are high, when purchases are novel and there is a greater need for information, when the number of alternatives considered is high, and when perceived risk is high.

The previous section outlined the circumstances under which groups rather than individual buyers are likely to make the purchase decision for the organization. In fact, buyers rarely make a buying decision independently of the influence of other members of the organization (Lilien and Wong 1984, Spekman and Stern 1979, Webster and Wind 1972). Therefore, it is likely that many buying decisions will be made by buying groups rather than by a single buyer.

Many researchers have recognized the importance of group buying rather than individual buying in organizations. These researchers have either concentrated on explaining how

the individual member preferences can be combined using decision models or on uncovering the conditions under which one organizational member or another has the greatest relative influence on the purchase decision. The next section discusses how researchers have conceptualized the convergence of individual member's preferences into one group choice, and reviews the findings from research that has focused on the relative influence of buying center members under various conditions.

Buying Center Choice

The buying center is an "informal, cross-departmental decision unit in which the primary objective is the acquisition, impartation, and processing of relevant purchasing-related information (Spekman and Stern 1979, p. 56). Conceptually, researchers have attempted to explain buying center choice through the employment of social decision schemes or by exploring the relative influence of the individuals making up the group.

Social Decision Schemes. According to social decision scheme theory, buying groups tend to aggregate divergent positions to a common decision by using decision making schemes (Zuber, Crott, and Werner 1992). Here, the group choice is seen as a modeling problem. In effect, the model assigns weights to the individual member's choices in order to arrive at the overall group choice. This weighting is seen

as a social process that is required to pool individual opinions into one group choice.

Table 2-1
Examples of Social Decision Scheme Models

1. Equiprobability - the group decision is equally probable among those alternatives advocated by one or more members.

2. Proportionality - the probability of a group decision is the proportion of members advocating that alternative.

3. Majority-Equiprobability - the group decides for an alternative if at least a majority advocates it. Otherwise the decision is equally probable among the alternatives advocated by members.

4. Minority-Proportionality - the group decides for an alternative if at least a majority advocates it. Otherwise an alternative is chosen with a probability equal to the proportion of members advocating it.

5. Majority-Average - the group decides for an alternative if at least a majority advocates it. Otherwise the decision is the alternative closest to the arithmetic average of the alternatives.

6. Plurality-Proportionality - the group decides for an alternative if at least a plurality advocates it. Otherwise proportionality is used.

7. Averaging - the group decision is the alternative closest to the arithmetic average of member preferences, unless the mean is the midpoint between two alternatives, in which case the two alternatives are equiprobable.

8. Median - the group decision is the alternative closest to the median value of the member preferences, unless the mean is the midpoint between the two alternatives, in which case the two alternatives are equiprobable.

Source: Kerr, et. al (1975)

Kerr, et. al (1975) provide some examples of social decision

scheme models (see Table 2-1). In marketing, Choffray and Lilien (1978) were among the first to conceptually relate group choice to the preferences of the individuals comprising the group using the modeling approach. They proposed that a weighted probability model, a proportionality model, a unanimity model, and an acceptability model would adequately capture the range of possible interaction patterns found in most organizational buying situations. Wilson, Lilien, and Wilson (1991) tested the ability of several social decision scheme models to predict group choice for modified rebuy and new task buying situations under conditions of low, moderate, and high perceived risk. They classified seven models of group choice into three categories. First, no-quota schemes where all group member's choices entered into the calculation of the group choice using some type of averaging technique (e.g., equiprobability rule). Second, an agreement-quota scheme where group members act as if they are using some prespecified agreement quota (e.g., majority rule). Finally, an individual decision scheme where the supplier choice is made autocratically. Their findings generally indicate a use of individual decision making when perceived risk is low, and either agreement-quota or no-quota rules when perceived risk is high.

While these modeling approaches have the advantage of

conceptual parsimony, there are at least two drawbacks associated with the use of social decision schemes to predict group choice. First, there exist numerous social decision making schemes which reduce researchers abilities to uncover systematic relationships between these models and group choice (Zuber, Crott, and Werner 1992). Another drawback stems from the static nature of the data that are used to predict the group choice. Specifically, social decision schemes are not concerned with how individual opinions change after a group discussion and decision (Wilson, Lilien, and Wilson 1991; Zuber, Crott, and Werner 1992). In other words, social decision schemes ignore the effect of influence processes that transpire during the group discussion.

A number of researchers have explored the effect of relative influence on buying center preferences and choice under various conditions. The following section will discuss this research.

Relative Influence. Webster and Wind (1972) were among the first to emphasize the interpersonal influences that transpire within a buying group. They proposed that five tactics could be employed by buyers to influence the decisions of other members of the buying center. They include: (1) rule-oriented tactics, (2) rule-evading tactics, (3) personal-political tactics, (4) educational tactics, and (5)

organizational-interactional tactics. Rule-oriented tactics are appeals to organizational rules or formal statements. Rule-evading tactics include complying with requests from others that violate organizational policies such as ordering more than policies allow. Personal-political tactics rely on informal relationships and friends to get decisions made, perhaps by exchanging favors. Educational tactics include presenting facts to persuade others. Finally, Organizational-interactional tactics involve changing the organizational structure and pattern of information flows.

In a study examining the relationship between environmental uncertainty and power attributed to a buyer, Spekman and Stern (1979) found that buyers become more influential members of the buying center as the environment becomes more turbulent and unstable. They propose that buyers are able to absorb uncertainty for other buying group members since they act as boundary role personnel for the organization and are able to gather and analyze relevant environmental information. This ability to gather and analyze relevant environmental information enhances their power and ability to influence other decision making members.

Thomas (1982) explored the relationship between formal and informal normative and informational social influence (four factors) provided by a fictitious organizational member on the relative importance evaluations of various at-

tributes of a hypothetical scientific and technical information service as rated by respondents. Using a sample of librarians, scientists, and administrators primarily from the chemical and pharmaceutical industries, he found that a combination of informal, informational and formal normative influence (operationalized as credibility, expertise and authority, relative position in the organization respectively) significantly changed the respondents service attribute evaluations. In addition, the four way interaction between the four bases of influence significantly affected service attribute evaluations. In this study informal normative influence was operationalized as stature, prestige, and friendship and formal informational influence was operationalized as product preferences. This finding suggests that the number of influence bases as well as the type of influence affects product evaluations.

For librarians alone, formal normative influence, as well as the interactions between informal normative, informal informational, and formal informational influence, informal normative, formal normative, and formal informational influence, and the four way interaction changed the service attribute evaluations.

For scientists, informal normative influence as well as the interactions between informal normative and informal informational influence changed the service attribute evalu-

ations. Finally for administrators, informal, normative influence changed the service attribute evaluations.

In a related study, Thomas (1984) characterized formal normative influence as legitimate power, informal informational influence as expert power, and informal normative influence as referent power from the French and Raven (1959) taxonomy and his operationalizations of these constructs. He related these bases of power to a self-assessment of expected preference change as to the importance of price in the organizational purchase of scientific and technical information services. His findings suggest that expert power is the most effective base in changing perceptions of the importance of price in the purchase decision, followed by legitimate power and referent power.

In an exploratory study using secondary data drawn from the metalworking industry, Lilien and Wong (1984) found that users (i.e., production and engineering personnel) were more involved in earlier stages of the buying decision making process, whereas buyers and managers were more involved in later stages. These findings imply that users are more influential during the earlier stages of the buying process and buyers and managers are more influential in the later stages. However, this study may have confounded the concept of an individuals participation in decision making with their influence in the final outcome of the decision.

Jackson, Keith, and Burdick (1984) explored purchasing agents perceptions of the relative influence of purchasing, manufacturing, engineering, management, and other personnel for different buyclasses, product types, and decision types in a sample of manufacturing firms. Although they found no differences in perceived relative influence of these different buying center members across buyclasses, differences in perceived relative influence were found between product types and decision types. The product classes examined in this study were major capital equipment, minor capital equipment, materials, component parts, and supplies. Decision types were identified as product selection decisions and supplier selection decisions. For product selection decisions, the relative influence of engineering was greater for materials or component parts purchases rather than supplies. For supplier selection decisions, the relative influence of purchasing was greater for materials rather than major capital purchases. Generally, the relative influence of purchasing was greater in supplier rather than product selection decisions across all product types. When the product class was either minor capital or supplies, the relative influence of manufacturing was greater for product rather than supplier selection decisions. When the product class was either materials or component parts, the relative influence of manufacturing and engineering was greater for

product rather than supplier selection decisions. Table 2-2 provides an overview of the remaining findings from this study.

Table 2-2
Relative Influence Among Buying Center Members
Adapted from Jackson, Keith, and Burdick (1984)

Product Type	Decision Type	
	Product Selection	Supplier Selection
Major Capital		Engineering > Management
Minor Capital	Manufacturing > Management	
Materials	Engineering > Manufacturing > Management	Engineering > Management
Components	Engineering > all others, Manufacturing > Management	Engineering > Management, Engineering > Manufacturing
Supplies	Manufacturing > Management	
Across all Product Types	Purchasing & Engineering > Management	Purchasing > all others

A subsequent study by Leigh and Rethans (1985) used a script elicitation technique to determine the relative influence of users versus buyers at various stages of the purchasing process as perceived by buyers. The specific findings of their study are reported in Table 2-3. Generally, greater relative influence of the using department on the purchase decision occurred at the beginning and ending

stages of the process.

Table 2-3
Perceived Relative Influence of Users and Buyers at Different Stages of the Purchasing Process
Adapted from Leigh and Rethans (1985)

Buying Decision Stage	Main Influence
1. Determine equipment need	User
2. Determine general specifications	User
3. Determine final specifications	User
4. Determine list of vendors	Buyer
5. Initial screening of vendors	Buyer
6. Meet sales representatives	Buyer
7. Final screening of vendors	Buyer
8. Send request for quotations	Buyer
9. Evaluate quotations	Buyer
10. Negotiate with final vendors	Buyer
11. Select the final vendor	Buyer
12. Acceptance of equipment	User
13. Verify equipment performance	User
14. Payment of vendor invoice	Buyer

In their study exploring the effect of buyclasses on industrial purchasing behavior, Anderson, Chu, and Weitz (1987) found that the more frequently salesforces encountered new task buys, the more frequently technical personnel were the major influencers and the less frequently buyers were key.

A further study by Kohli (1989) looked at the effect of

reinforcement power (reward and coercive power together), legitimate power, expert power, information power, and departmental power on manifest influence (i.e., changes in purchase opinions) under variations in buying center size, buying center member familiarity, buying center cohesiveness, perceived risk, and decision time pressure. He found that expert power was the most important determinant of changes in purchase decision opinions, followed by reinforcement power. In addition, expert power was related more strongly to changes in purchase opinions in buying centers that were larger, more cohesive, and under low decision time pressure. Finally, reinforcement power was related more strongly to changes in purchase opinions in buying centers that were smaller, less cohesive, and under higher time pressure.

McQuiston and Dickson (1991) designed a study to test the relationship between a buying center member's perceived personal consequences associated with a buying decision and their participation and influence in the decision process. Their major conclusion was the higher the perceived personal consequences associated with a purchase decision, the more influential they perceived themselves to be.

Summary. In summary, research concerned with the relative influence of buying center participants has shown that the relative influence of buying center members changes as the

buying situation changes. Their findings suggest that the relative influence of buying center members change as result of environmental factors (e.g., environmental uncertainty), individual and organizational factors (e.g., personal consequences and bases of power), stage of the buying process, and buyclass.

While it is meaningful to know how relative influence over the final choice decision changes under various circumstances, little is known about how this relative influence factors into the actual buying center's group choice. None of the research reviewed deals with the more basic question "What is the effect of these influence processes on buying center choice?" For example, none of this research examines the actual preferences and choices of the individual members before influence compared with the buying center's overall group choice after influence. Comparing individual member's preferences and choices with those of the buying center would allow us to have a better understanding of how influence processes relate to actual purchase choice.

Marketing researchers have attempted to explain the more intricate operation of influence under various moderating conditions, rather than stepping back and exploring the more basic question of how the influence of buying center members determines buying center choice. Due to this micro-perspective, marketing researchers have neglected some

social psychological processes that are unique to groups, and could operate within buying center discussion. These processes include social facilitation, social loafing, deindividuation, groupthink, minority influence, and group polarization. The reason that these group influence processes are so important to marketers is that they have been found to have an effect on decision making and choice in other contexts.

The goal behind the dissertation was to help close this knowledge gap by exploring the effect of choice shift in the organizational buying context. The next section will discuss how knowledge of choice shift effects evolved, by discussing the seminal research of James Stoner who uncovered the propensity of a group to make a riskier rather than more cautious choice than the individuals who comprise the group. This propensity was referred to as the risky shift phenomenon.

The Risky-Shift Phenomenon

Prior to the work of James Stoner, one prevailing view of group decision making regarding the degree of risk to take was that individuals with differing preferences and choices on a decision-issue within a group would tend to converge and compromise on the average position of their members (Turner 1991, Wallach and Kogan 1965). Another view was that groups would move toward more conservatism when

required to achieve consensus for fear of appearing irresponsible through making extreme recommendations (Wallach and Kogan 1965).

Contrary to these assumptions, James Stoner (1961) found evidence that, when faced with a decision of how much risk to take, groups required to reach a consensus, on average made riskier decisions than individuals. In his experiments, Stoner (1961) had six people at a time respond as individuals to a series of story problems called choice-dilemmas (see Figure 2-1). Their task was to advise a fictional character as to how much risk he should take in each of a number of different scenarios. After individually providing their advice on how much risk to take in each case, the decision makers assembled as a group and discussed each dilemma until they agreed. Contrary to the thought of the time, Stoner demonstrated that group decisions were more risky than the average of the individual members before the group interaction.

This counter-intuitive finding (dubbed the "risky-shift phenomenon") inspired much subsequent research. This work demonstrated that the results were not peculiar to a specific subject population, but were more general than expected. Furthermore, work by Teger and Pruitt (1967) demonstrated that the label "risky shift phenomenon" was a misnomer, and that choice-dilemmas that elicited relatively cautious

responses tended to produce even more cautious responses after discussion. In general, decisions which elicit relatively risky initial tendencies generally yield further shifts toward the risky extreme after group discussion, while decisions with initially cautious tendencies shift to even greater caution after discussion (Dwyer 1984). This phenomenon has subsequently been termed group polarization.

George, a competent chess player, is participating in a national chess tournament. In an early match he draws the top-favored player in the tournament as his opponent. George has been given a relatively low ranking in view of his performance in previous tournaments. During the course of his play with the top-favored man, George notes the possibility of a deceptive though risky maneuver which might bring him a quick victory. At the same time, if the attempted maneuver should fail George would be left in an exposed position and defeat would almost certainly follow.

Imagine that you are advising George. Please check the lowest probability that you would consider acceptable for the risky play in question to be attempted.

George should attempt to play if the chances are at least:

_____1 in 10 that the play would succeed
_____2 in 10 that the play would succeed
_____3 in 10 that the play would succeed
_____4 in 10 that the play would succeed
_____5 in 10 that the play would succeed
_____6 in 10 that the play would succeed
_____7 in 10 that the play would succeed
_____8 in 10 that the play would succeed
_____9 in 10 that the play would succeed
_____George should attempt the play only if it is certain (i.e., 10 in 10) that the plat would succeed.

Figure 2-1
Sample Choice-Dilemma Problem

Source: Myers and Lamm (1976)

Group Polarization

Myers and Lamm (1976, p. 603) generalized this stream of findings into a *group polarization hypothesis*: "The average postgroup response will tend to be more extreme in the same direction as the average of the pregroup responses." Group polarization refers to the change in the individual group member's preferences resulting from group discussion. Choice shift refers to the difference between the group's mean individual prediscussion preferences and the overall group choice after group discussion (Zubert, Crott, and Werner 1992). Choice shift would occur if a buyer initially had a weak preference for an outsupplier (i.e., a more risky supplier that supplies the same products or services as a current, or in-supplier) rather than a current supplier, and discussed the choice of suppliers with other buying center members who also initially had a weak preference for an outsupplier, we might expect the buying center's choice to be very strongly in favor of an outsupplier.

Over the past thirty years, several theories have been advanced to explain the polarization and choice shift of preferences in groups. The following section identifies the most popular of these theories, as they are applied in the buying context.

Theories of Group Polarization and Choice Shift

Several theories have been advanced to explain group polarization and choice shift, including: (1) diffusion of responsibility theory; (2) familiarization theory; (3) the trait theory of leadership; and, (4) value theory (Pruitt 1973).

Diffusion of Responsibility Theory. Diffusion of responsibility theory holds that group discussion reduces anxiety about negative consequences associated with making a poor decision because the negative consequences can be diffused from one's own shoulders to those of other group members. Reduced anxiety makes it possible to accept the risky alternative at a lower probability of success (Pruitt 1973). Diffusion of responsibility theory has been discounted as a viable explanation of the group polarization phenomenon since it can only explain shifts toward risk, not shifts toward caution.

Familiarization Theory. Familiarization theory holds that group discussion results in increased familiarity with the decision problem. This increased familiarity should make people more willing to take risk because of a general reduction of uncertainty (Pruitt 1973).

Since familiarization theory can only explain shifts toward risk, it has also been discounted as a viable explanation of the polarization phenomenon.

Trait Theory of Leadership. The basic idea behind the trait theory of leadership is that "high risk takers" are more persuasive in group discussions that produce shifts toward risk, and that "cautious individuals" are more persuasive in discussions that produce shifts toward caution (Pruitt 1973).

Empirical evidence has demonstrated that subjects who polarize do not perceive people within their group designated as "high risk takers" to be more influential, thus disproving this explanation (Wallach, Kogan, and Burt 1968).

Value Theory. Value theory is actually a set of theories that have the common assumption that groups shift in the direction toward which most members of the group are already attracted as individuals. Two of the most popular versions of value theory are social comparison theory and persuasive arguments theory (Pruitt 1973).

Social Comparison Theory. According to social comparison theory, buyers are constantly motivated to perceive and present themselves in a socially desirable light. To do this, a buyer must continuously process information about how other people in the buying center present themselves (i.e., as to what they value), and adjust their own self-presentation accordingly.

One version of social comparison theory states that buyers desire to be more favorable than the average individ-

ual in the buying center. Once a buyer determines how the other people in the buying center present themselves, he presents himself in a more favorable light. When all the members in the buying center engage in this same social comparison process, the result is polarization in the direction of greater social value.

There exist two variations to the above sequence, one involving the removal of pluralistic ignorance, and the other emphasizing one-upmanship (bandwagon effects). According to the pluralistic ignorance explanation, buyers present their own opinions as compromises between two tendencies, the desire to be close to one's own ideal, and the desire not to be too deviant from the average of the buying center. Prior to group discussion, buying center members underestimate the buying center norm and are somewhat distant from their ideal position. Buyers select an attitude or choice somewhere between their ideal and the underestimated buying center norm. During group discussion, they are exposed to the actual buying center norm which is closer to their ideal than they originally expected. The individual buying center members then polarize to their ideal positions and group choice shift is observed. The assumption behind this explanation is that pluralistic ignorance exists because of the lack of accurate communication about the true beliefs of a majority of buying center members.

A second explanation of the effects of social comparison processes on polarization is bandwagon effects. With the bandwagon effects explanation, buyers are motivated by a desire to be different and distinct from other buying center members in a desired direction (one-upmanship). Buyers are also motivated to present themselves somewhat more favorably than other buying center members. Buyers want to be different from and better than other members. When making initial choice ratings, buyers give themselves a rating that is somewhat more favorable than the rating they presume the average buying center member will give. When they discover what the true norm is, they will then improve their own ratings producing an overall polarization effect.

These social comparison processes (i.e., bandwagon effects and one-upmanship) are actually a process of normative influence. Normative influence refers to a change in a buyers preferences based on his desire to be accepted by other members of the buying group (Turner 1991).

The major support for social comparison theory has come from demonstrations that the mere exposure of other group members' positions can produce polarization effects (see Isenberg 1986 and Myers and Lamm 1976 for comprehensive reviews of research prior to 1983). Isenberg (1986) has reported a meta-analysis of twenty-two studies examining the effect of mere-exposure on polarization. The average corre-

lation for these studies is r = 0.436. According to Lipsey (1990) this effect size is large.

More recently, Jesunio (1986) found that explicit or implicit group rules dictating how a decision was to be made moderated the impact of normative influence. Specifically, normative influence had more impact when decisions were made using directive styles as opposed to consensual or laizze faire styles of decision making.

Spears, Lea, and Lee (1990) also provide evidence of polarization due to conformity to group norms, using a deindividuation explanation. Deindividuation is a loss of self-awareness and evaluation apprehension brought about by group membership that fosters anonymity (Myers 1990). They found that deindividuated subjects' attitudes polarized significantly more toward the group norm than individuated subjects. Furthermore, deindividuating discussants who were immersed in a group produced a greater polarization toward the preestablished group norm than deindividuating discussants who were treated as individuals. Further information concerning the specifics of these studies is presented in Table 2-4.

In conclusion, existing evidence provides strong support for the explanation that social comparison processes cause choice shift to occur in groups. However, no studies have examined the effect of social comparison processes on

choice shift in the organizational buying context.

Persuasive Arguments Theory. A second version of value theory has explored the effect of argumentation processes on group polarization and choice shift. Persuasive arguments theory holds that the dominant values held by a buying center concerning a procurement decision elicits persuasive arguments during the group discussion that convince members to move further in the direction of these values (Vinokur and Burnstein 1974).

The buyer's initial choice or position on an issue is a function of the number and persuasiveness of pro and con arguments that a buyer can recall from memory when formulating his or her own opinion. Buying center discussion causes the buyer to polarize in a given direction to the extent that the discussion exposes the buyer to persuasive arguments favoring that direction.

Two factors determine how persuasive a given argument will be, the validity and novelty of the argument. Validity refers to how true or logical the argument is and whether it fits with the buyer's previous views. Novelty refers to how new the ideas are or if they allow the buyer to think about the choice in different ways.

Together, the perceived validity and novelty of an argument determine how effective an argument will be in causing polarization, however the role of novelty is cen-

tral. If arguments are presented that a buyer is already aware of, no polarization will occur as a result of buying center discussion. If novel arguments are presented that are opposite to the direction initially favored by a buyer, their position will move in the opposite direction and depolarize.

The process by which persuasive arguments operate is analogous to informational influence. Informational influence refers to a change in a buyers preferences resulting from accepting evidence about the procurement (Turner 1991).

The evidence in support for persuasive arguments theory is extensive (see Isenberg 1986 and Myers and Lamm 1976 for a review of research prior to 1983). Isenberg (1986) has reported a meta-analysis of twelve studies examining the effect of persuasive arguments on group polarization. The average correlation for these studies is 0.746. According to Lipsey (1990) this effect size is large.

More recently, Clark (1988) looked at the effects of initial risk preference and minority versus majority influence on polarization. Generally, he found that minorities who argue for the majority position will have more influence than minorities who argue against the majority position, supporting persuasive arguments theory. For more specific information concerning this study please see Table 2-4.

Table 2-4
Recent Studies on the Effect of Social Comparison and Persuasive Arguments

Study	Theory Tested	Instrument	Subjects	N	Independent Variables
Jesuino (1986)	Social Comparison	Choice Dilemmas	M & F Students	122	1. Normative Intervention 2. Leader Behavior 3. Control Group
McLachlin (1986)	Persuasive Arguments versus Referent Informational Influence	Choice Dilemmas and Attitude Items	M & F Students	86	1. Item Type 2. Decision-Based Activity 3. Argument Set 4. Item Number
Clark (1988)	Persuasive Arguments	Choice Dilemmas	M & F Students	620	1. Value Category 2. Subject Preference 3. Group Type 4. Measure
Spears, Lea and Lee (1990)	Social Comparison Via Deindividuation	Attitude Items	M & F Students	48	1. Visual Anonymity 2. Group Salience 3. Norm Reference
Abrams et. al (1990)	Referent Informational Influence	Choice Dilemmas and Attitude Items	M & F Students	116	1. Pre/Post Opinions 2. Group Salience

Table 2-4 (Continued)
Recent Studies on the Effect of Social Comparison and Persuasive Arguments

Study	Dependent Variables	Results
Jesuino (1986)	Pre/Post Likert Scale Response Differences	No differences were found for different leadership styles. Previous initial choices were the most important predictor of post discussion polarized choice. Information was 2 to 3 times more important in the consensual and laizze faire conditions, and equally as important as norms in the directive condition.
McLachlan (1986)	Pre/Post Responses to Choice Dilemmas and Attitude Items and Perceived Relevance of Arguments	The perceived relevance of arguments was affected by the type of item with which the arguments were associated and the manner in which the decision item was considered. Results offer a challenge to persuasive arguments theory and support referent informational influence perspective.
Clark (1988)	Pre/Post Risk Level for Majority and Experimental-Control differences for Minority.	For risky items, a minority that argued for a risky alternative was able to change a cautious majority towards risk. A cautious minority had no affect on a risky majority. For neutral items, minorities advocating the risky alternative were unable to influence a cautious majority. A cautious minority had no affect on a risky majority. For cautious items, risky minorities were unable to change a cautious majority. (Continued)

Table 2-4 (Continued)
Recent Studies on the Effect of Social Comparison and Persuasive Arguments

Study	Dependent Variables	Results
Spears, Lea, and Lee (1990)	Pre/Post Attitudes on Discussion Topics	Attitudes were significantly more polarized towards the group norm in the deindividuized condition than in the individuized condition. Deindividuating discussants who were immersed in a group produced a greater polarization towards a preestablished group norm than deindividuating discussants who were treated as individuals.
Abrams et. al (1990)	1. Prediscussion Differences Between Groups 2. Postdiscussion Differences Between Groups 3. Pre/Post Discussion Differences Between Groups	Subgroup members converged to a greater extent when the difference between the subgroups was not made salient.

In conclusion, existing evidence provides strong support for the explanation that persuasive arguments cause choice shift to occur in groups. However, no studies have examined the effect of persuasive arguments on choice shift in the organizational buying context.

Critique of Value Theory. As was previously mentioned, the major assumption of value theory is that groups shift in a direction toward which most members are already attracted as individuals.

The normative influence explanation for choice shift is that other buying center members reveal what they value during group discussion, individual members then adjust their own self-presentation accordingly. If most members value risk, the shift will be toward more extreme risk. If most members value caution, the shift will be toward more extreme caution.

The informational influence explanation for choice shift is that each individual buying center members values drive the number of pro and con arguments presented during group discussion. If a greater number of arguments favor risk, the shift will be toward more extreme risk. If a greater number of arguments favor caution, the shift will be toward more extreme caution.

One shortcoming of value theory is its inability to predict an individuals predisposition towards risk or cau-

tion. In other words, both social comparison theory and persuasive arguments theory are mute with respect to the formation of an individuals predisposition toward risk or caution. This is a critical gap in the theoretical formulation, since individuals predisposed toward risk are likely to shift toward more extreme risk, and those predisposed toward caution are likely to shift toward more extreme caution.

A second criticism of value theory has been presented by Turner (1991). He proposes that the dichotomy of normative and informational influence as two distinct processes explaining the shift of group preferences is invalid. Turner suggests that informational and normative influence are not two independent processes but are interdependent. The basis for the argument is as follows.

Informational influence must be valid to be influential. The validity of information presented during group discussion can be tested by an individual in one of two ways. First, people can employ physical reality tests where they use objective, physical, and non-social means to test a belief directly against reality. Alternatively, they can use social reality tests where people can compare their views with others and seek the agreement of reference group members. The persuasive impact of informational influence can be thought of as a two phase process including physical

testing of reality at the individual level and consensual validation by similar others (i.e., social validation). Based on these notions, Turner and his colleagues have developed an explanation of group polarization and choice shift in terms of a process of conformity to in-group norms, variously termed referent informational influence, social identification or self-categorization theory (Abrams et. al 1990, Hogg, Turner, and Davidson 1990, Turner and Oakes 1986, Turner, Wetherell and Hogg 1989).

Self Categorization Theory. Self-categorization theory rejects the notion that normative and informational influence are two distinct processes leading to choice shift. It proposes that persuasive influence is mediated by other's informational validity and their social normative value and that these are the same thing. Buyers conform to positions perceived as normative or (stereotypical of) the buying center because, in reflecting the agreement of similar others, these positions provide subjectively valid evidence about the buying situation.

In a procurement situation, other buying center members preferences become important. Buyers then conform to the buying center norm, the position perceived as most consensual. This buying center norm is then perceived as normative/informationally valid. The better some buying center member expresses the agreement of the other buying center

members, the more correct, valued, and persuasive that particular person will be. It is assumed that buying center members perceiving themselves to be less correct shift toward the more correct, but that there is no tendency for the more correct to feel persuaded by the less correct. Therefore, relative influence of a buying center member is mediated by how representative his preference is in relation to other buying center members (i.e., prototypical), and pressures for mutual agreement within a buying center lead to convergence upon the most prototypical member.

The explanation of polarization is that polarization to the mean buying group response embodies the process of convergence upon the most representative buying group member. Choice shift will occur when the prototypical member's preference is more extreme than the initial mean group preference (Turner and Oakes 1986).

Empirical Evidence. To date few studies have examined models of group polarization derived from self-categorization theory. Mackie (1986) tested several predictions from the theory. Specifically, she tested the notion that categorization of the social environment would affect the perception of group characteristics, that attitude polarization would only occur when individuals are exposed to communications from their own group, and that polarization results from conformity to perceived ingroup norms. She found that the

characteristics of groups were perceived to be more extreme than those of individuals inferred from identical information. Attitude polarization occurred only when subjects perceived themselves in terms of their group membership, and were exposed to information about the group they identified with. Furthermore, polarization resulted form conformity to an extremitized norm.

Turner, Wetherell and Hogg (1989) investigated the extent to which polarization depends upon the perception of group members' responses as stereotypical of, or normative for, an ingroup category. They found that stereotypically risky groups polarized toward risk and stereotypically cautious groups polarized toward caution, consistent with the social comparison, informational influence and referent informational explanations of polarization. However, they also found that risky and cautious individuals tended to shift away from their stereotype or did not shift significantly. The same behavioral tendency produced opposing effects when perceived as either a shared norm distinguishing one group from another or as an individual personality trait, consistent with the referent informational influence explanation.

Hogg, Turner, and Davidson (1990) explored the effects of social frames of reference and predisposition toward risk or caution on polarization. They tested the hypothesis that

group choice would tend to shift depending on the group's knowledge of the position of a contrasting outgroup which comprised the social frame of reference. They found that a risky frame of reference would produce a shift toward caution, a cautious frame of reference would produce a shift toward risk, and a neutral frame of reference would produce no shift. Specifically, the frame of reference manipulation polarized the ingroup norm toward risk in the cautious condition and toward caution in the risky condition. The next section will provide a critique of self-categorization theory.

Critique of Self-Categorization Theory

In summary, the self-categorization explanation is beginning to accumulate support for its predictions. However, not all results are positive. For example, Rabbie et.al (1989) manipulated the interdependence structure between the parties in groups. They found that polarization was more pronounced for subjects who depended on their ingroup and outgroup for rewards than for subjects in the balanced dependence condition, contradicting the predictions from the theory. For more specific information concerning this study please see Table 2-1.

One of the major strengths of this theory is that it recognizes the important role that frames of reference play in determining the direction of polarization. Unfortunate-

ly, this is also one of the weaknesses of the theory, since details concerning the social frames used by individuals are not specified. As will be seen, other conceptualizations specifying the interplay between reference frames and choice make much clearer predictions.

Turner (1991) emphasizes the interdependence of normative and informational influence processes in assessing the validity of information presented during group discussion. However, Turner's (1991) logic is deficient in that the refutation of normative and informational influence as two distinct processes leading to polarization and choice shifts is based on the fact that individuals who employ physical reality checks to assess the validity of information must also use social reality checks to assess the validity of information presented during group discussion. For example, Turner states that "an individual whose cognitive activity produces results that nobody agrees with will not have confidence in their validity." It seems clear that an individual can have confidence in their thoughts without social validation.

In summary, both value theory (i.e., social comparison theory and persuasive arguments theory) and self-categorization theory recognize the important role of an individual's predisposition toward risk in determining the direction of group polarization or choice shift. While social comparison

theory and persuasive arguments theory are mute with respect to how these predispositions are formed, self-categorization theory proposes that the social frame of reference is a major determinant. Unfortunately, the details concerning precisely how social frames are used by individuals in determining their predispositions are not clearly specified.

The following section will expand on the notion that reference frames are a major determinant of an individuals predispositions toward risk.

Predispositions Toward Risk

The risky-shift phenomenon suggests that group decision making may be inherently more risky than individual decision making. Risky-shift was shown to be a special case of a more general group polarization hypothesis. A wealth of evidence exists to support this phenomenon. Two common explanations for the polarization effect include social comparison and persuasive arguments, both of which have received considerable empirical support. While the referent informational influence explanation seems to be gaining wider acceptance, its major contribution (i.e., reference frames) is ambiguously specified.

Nevertheless, social comparison and persuasive argument theories are unable to predict the direction of polarization (i.e., cautious or risky shifts) unless the initial predispositions of the individuals in a group are known. Further-

more, polarizing shifts tend to be negligible and unreliable when there is no initially dominant tendency (Turner 1991). Therefore, in order to fully explain and predict the direction and magnitude of any shift in a buying center's preferences for a product or supplier, it is necessary to incorporate explanations of how individuals form initial choices.

Two of the most commonly accepted theories of individual choice under risk are expected utility theory and prospect theory. The following section will briefly review these theories. The objective is to offer an explanation for how individual choices are formed under risk. Therefore, it is necessary to understand how the individual choice process can lead members of a buying center to form initial predispositions or attitudes toward a supplier. This is important because it is the initial predispositions toward risk or caution that dictates the direction of polarization during group interaction.

The following section reviews the major theories of individual decision making under risk, as applied to the organizational buying context.

Individual Decision Making Under Risk

Traditional models of individual industrial buyer decision behavior assume an expected utility framework (von Neumann and Morgenstern 1944). A supplier's proposals are presumed to be evaluated according to the traditional eco-

nomic model which is expected utility theory. Expected utility theory is the extension of classical utility theory that incorporates risk (e.g., imperfect information).

Expected Utility Theory. Utility is generally taken to mean the pleasure or satisfaction derived from a particular commodity or choice alternative (Puto 1985). Expected utility theory proposes that the overall utility of a choice alternative (i.e., prospect) is the expected utility of its outcomes. For example, if an individual had a choice between:

Alternatives	Payoffs	Expectations		E(U)
Alternative A:	$5,000	x 100%	=	$5,000
Alternative B:	$10,000	x 60%	=	$6,000

the individual would choose the risky prospect since the expected utility of the risky prospect is highest. Conversley, if an individual had a choice between:

Alternatives	Payoffs	Expectations		E(U)
Alternative A:	$5,000	x 100%	=	$5,000
Alternative B:	$10,000	x 40%	=	$4,000

the individual would choose the cautious alternative with the highest expected utility. Finally, in the case where the expected utility for the risky prospect and the cautious prospect are equal:

Alternatives	Payoffs	Expectations	E(U)
Alternative A:	$5,000	x 100% =	$5,000
Alternative B:	$10,000	x 50% =	$5,000

the individual would choose the cautious alternative since expected utility theory assumes risk aversion. Contrary to expected utility theory, Kahneman and Tversky (1979) found that individuals tend to overweight certain outcomes compared to probable outcomes. Individuals seem to prefer a lower certain outcome over a probable outcome with higher expected utility (i.e., certainty effect). For example, if an individual had a choice between:

Alternatives	Payoffs	Expectations	E(U)
Alternative A:	$5,000	x 100% =	$5,000
Alternative B:	$10,000	x 60% =	$6,000

Kahneman and Tversky (1979) found that individuals would actually choose the cautious prospect (i.e., contrary to expected utility theory). Furthermore, peoples preferences for risky or certain outcomes depends on whether the decision is viewed as a gain or a loss. For example, If an individual had a choice between two losses:

Alternatives	Payoffs	Expectations	E(U)
Alternative A:	-$5,000	x 100% =	-$5,000
Alternative B:	-$10,000	x 60% =	-$6,000

individuals tended to choose the risky prospect with the lower expected utility (i.e., reflection effect).

In summary, contrary to what expected utility theory would predict, Kahneman and Tversky (1979) suggest that buyers probably: (1) evaluate products or suppliers by expressing their offers as gains or losses in comparison with some subjectively determined reference point in their mind; and (2) tend to be risk averse for choices involving gains and risk seeking for choices involving losses. Based on these important findings, Kahneman and Tversky (1979) developed prospect theory to explain how individuals make choices under conditions of risk.

Prospect Theory

A prospect is simply a choice alternative such as a product/supplier. The central concept of prospect theory is the notion that the buyer's choice process has two stages, an editing stage and an evaluation stage (Kahneman and Tversky 1979, Qualls and Puto 1989).

In the editing stage (which incorporates context effects on the decision process), the buyer restructures the choice problem into a more simplified form. This stage can incorporate one or several processes to simplify or restructure the choice problem. Editing processes include: coding, combination, segregation, cancellation, simplification, and dominance (Kahneman and Tversky 1979).

During the coding process, the buyer identifies a reference point and codes each alternative as either a gain

or loss with respect to that reference point. Combination allows the buyer to simplify an alternative by combining the probabilities associated with identical outcomes. For example, if supplier A is given a 25% probability of on time delivery which would net the firm $100,000 and a 25% probability of perfect product quality which would also net the firm $100,000, the buyer might combine these probabilities to simplify the decision and arrive at a 50% chance that supplier A will net the firm $100,000.

Segregation occurs when the riskless components of a supplier's offering are separated from the risky component prior to evaluation. For example, if a supplier can deliver 80% perfect product quality which, if all were perfect, would net the firm $300,000 and offers a 20% chance of on time delivery which, if all deliveries were on time, would net the firm $200,000, then the buyer might decompose this supplier's offer into a sure gain of $200,000, and a risky prospect of $100,000 x .80. In other words, the expected utility before segregation is ($300,000 @ 80% + $200,000 @ 20% = $280,0000) and the expected utility after segregation is ($200,000 @ 100% + $100,000 @ 80% = $280,000) the same.

Cancellation involves discarding those components of each supplier's offer that are shared by each supplier in the set. In other words, outcomes common to all suppliers are excluded from consideration and each supplier is then

evaluated based on those attributes not shared. Simplification refers to rounding probabilities and/or outcomes. For example, a 52% chance of a supplier delivering on time that would net a firm $84,000 might be simplified to a 50% chance of on time delivery that could net the firm $85,000. Finally, dominance refers to the discarding of unlikely alternatives from the choice set.

In summary, during the editing stage an organizational buyer might disregard the parts of the supplier's offer which are similar to those of other suppliers, and focus on those aspects of the supplier's offer that distinguish suppliers. These distinguishing aspects between suppliers are then used for comparison by matching each supplier's offer with a reference point held in the mind of the buyer. This reference point, or decision frame, is used as the zero point on a scale of comparison, and each supplier's offer is seen as a gain or loss from that reference point (Qualls and Puto 1989). The output from the editing stage is then used as input for the evaluation stage.

In the evaluation stage, the simplified suppliers offers are evaluated based on the reference point (or decision frame), and the supplier with the best offer is chosen (Kahneman and Tversky 1979). The decision frame influences the buyer's perspective on the choice of product/supplier and may determine the relative importance of different

issues such as cost or delivery scheduling. The frame that is used for comparing suppliers is influenced partly by the purchase task and partly by habits and the personal characteristics of the decision maker (Schurr 1987), and could include an ideal (i.e., the best possible) supplier (or aspiration level for the buyer), a typical (i.e., the average) supplier (or expectation of the buyer), or an example supplier.

The evaluation of each supplier's offer is governed by two functions, a value function and a weighting function. The value function has three properties (see Figure 2-2): (1) the initial value of the reference point equals zero; (2) the function is concave for gains and convex for losses; and (3) the function is steeper for losses than for gains (Kahneman and Tversky 1979). The value of a supplier's offer is determined by how far above (positive) or below (negative) the buyer's reference point the offer is (Tversky and Kahneman 1981). Concavity of the function above the reference point implies that buyers are risk averse for gains. Convexity below the reference point implies buyers are risk seeking for losses. Since the slope of the function is steeper for losses than for gains, losses are perceived to be greater than gains of equal magnitude.

Prospect theory proposes that the manner in which people regard risky options is described by the value func-

tion (see Figure 2-2). The value function represents the relation between objectively determined gains and losses and the subjective value a person places on these gains and losses (Whyte 1989). It implies that people evaluate the outcomes of decisions in terms of gains or losses relative to some subjectively determined reference point. The result is that the selection of a reference point can have predictable effects on the perceived attractiveness of outcomes because identical outcomes can be evaluated as either gains or losses, depending on the selection of this point.

The propositions advanced by the weighting function are not included in the present research. Therefore, this portion of prospect theory is included for completeness only. The weighting function involves the treatment of probabilities (Tversky and Kahneman 1981). In expected utility theory the utility of an uncertain outcome is weighted by the probability of the outcome occurring. In prospect theory the value of an uncertain outcome is multiplied by a decision weight $\pi(p)$, which is a monotonic function of p but is not a probability. The weighting function has three properties (see Figure 2-3): (1) impossible events are discarded, $\pi(0) = 0$, and the scale is normalized so that $\pi(1) = 1$; (2) low probabilities are overweighted $\pi(p) > p$, moderate and high probabilities are underweighted, $\pi(p) + \pi(1 - p) =< 1$; and (3) for any fixed probability ratio q,

the ratio of decision weights is closer to unity when the probabilities are low than when they are high, for example,

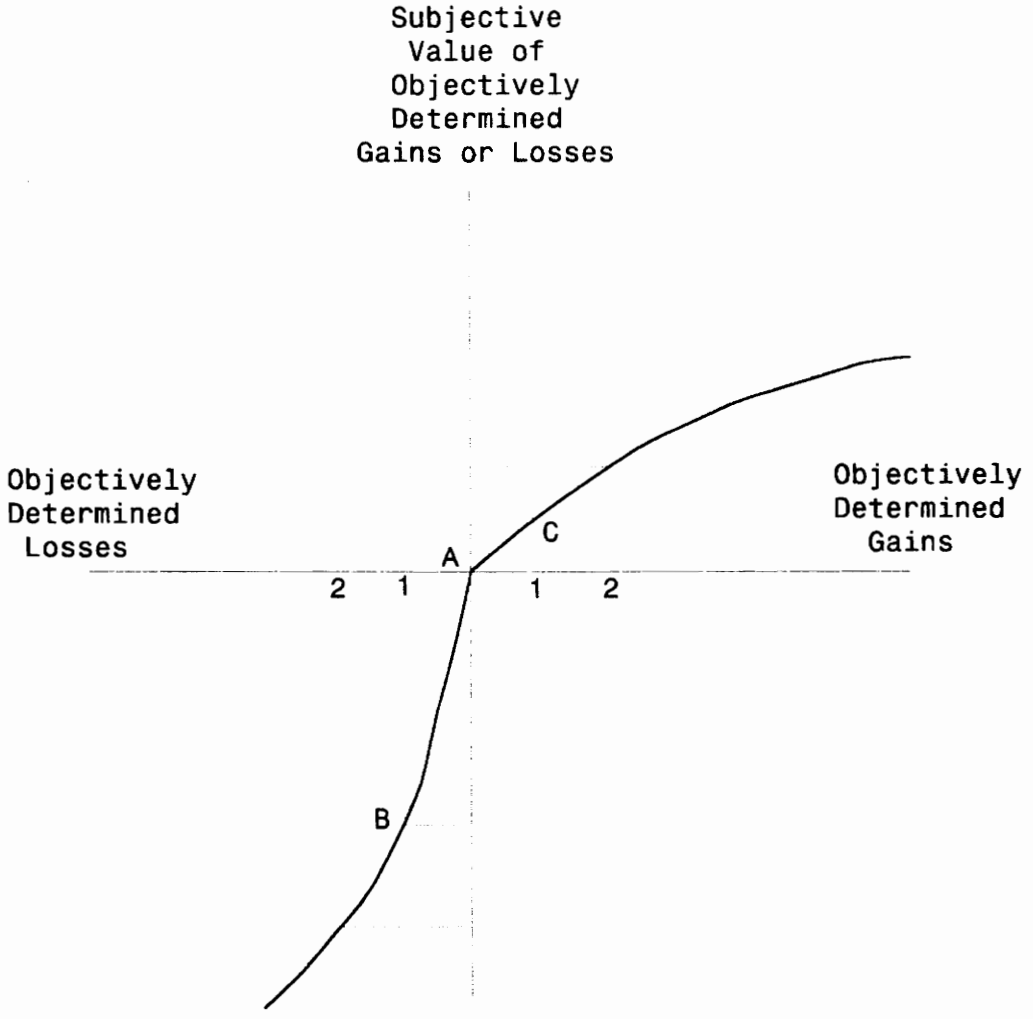

Figure 2-2
Hypothetical Value Function
Kahneman and Tversky (1979)

$\pi(.1)/\pi(.2) > \pi(.4)/\pi(.8)$.

The weighting function serves as a measure of contextual factors that could influence the decision, such as the ambiguity of information provided by the supplier or uncertainty regarding the supplier's reputation (Kahneman and Tversky 1979). The value of each supplier's offer is not just determined by the outcome each supplier can provide to the buyer's firm and the likelihood that the supplier will deliver as promised. It is also a function of the impact of events or contextual factors that impact on the desirability of each supplier's offer.

In summary, a buyer probably evaluates alternative suppliers based on a reference frame in his or her mind. The dependence of an individual's preferences (for cautious or risky outcomes) on a reference point has commonly been termed a "framing effect". The following section more closely examines this framing effect.

The Framing Effect. The observation that individuals make judgements beginning from some initial value (or reference point) is not new. In 1974 Tversky and Kahneman noted that people make estimates by starting from an initial value (i.e., an anchor) that is adjusted to yield the final answer. A decision frame refers to a "decision maker's conception of the acts, outcomes, and contingencies associated with a particular choice" (Tversky and Kahneman 1981).

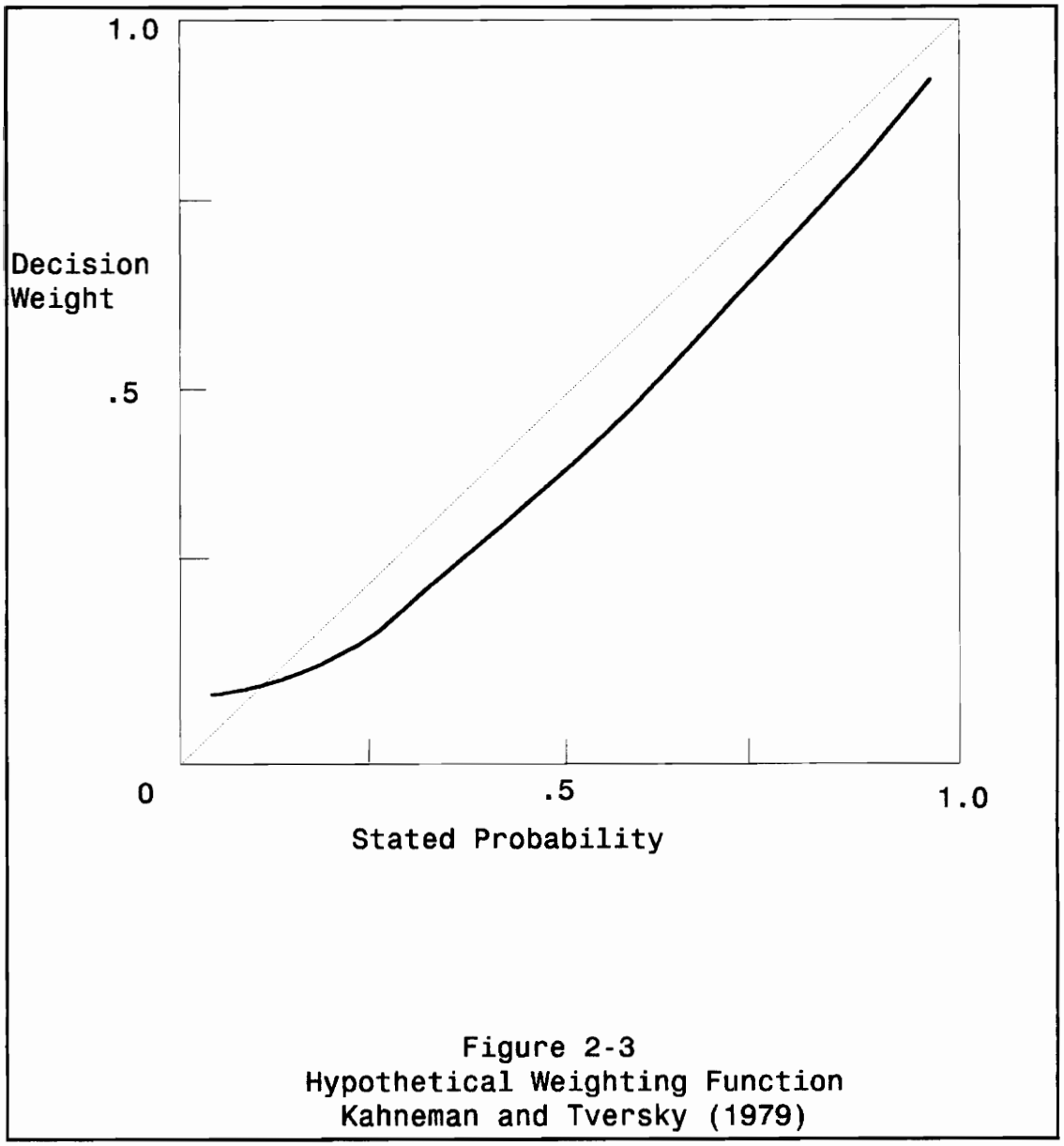

Figure 2-3
Hypothetical Weighting Function
Kahneman and Tversky (1979)

A decision frame may be suggested by the formation of the problem, it may be the result of a partial computation, or it may be influenced partly by habits and personal characteristics (Schurr 1987, Tversky and Kahneman 1974). For example, a sales message implying that a buyer who did not take advantage of a chance to decrease costs would be losing ground to the competition might frame a buyer's decision as a loss (Puto 1985).

Prospect theory proposes that a decision maker's risk preference is described as a mixture of risk seeking when individuals choose between choices that are framed as losses and risk aversion when individuals choose between choices that are framed as gains (Kahneman and Tversky 1979). To be risk seeking is to reject a certain outcome in favor of a probablistic outcome with an equal or lower expected value. To be risk averse is to prefer a certain outcome to a probablistic outcome with an equal or greater expected value (Whyte 1989).

An example of risk seeking when a decision is framed as a loss would be the rejection of a certain loss of $600 in favor of a gamble with a 60 percent chance of a $1000 loss and a 40 percent chance of no loss at all. An example of risk aversion when a decision is framed as a gain would be the acceptance of a $600 gain over a gamble with a 60 percent chance of $1000 gain and a 40 percent chance of no

gain.

Since the value function is generally concave for gains, and convex for losses, and steeper for losses than for gains, shifts of reference can change the value difference between outcomes and thereby reverse the preference order between options. Tversky and Kahneman (1981) provide the following example to illustrate this phenomenon:

> "Consider a person who has spent an afternoon at a race track, has already lost $140, and is considering a $10 bet on a 15:1 long shot in the last race. This decision can be framed in two ways, which correspond to two natural reference points. If the status quo is the reference point, the outcomes of the bet are framed as a gain of $140 and a loss of $10. On the other hand, it may be more natural to view the present state as a loss of $140, for the betting day, and accordingly frame the bet as a chance to return to the reference point or to increase the loss to $150. Prospect theory implies that the latter frame will produce more risk seeking than the former. Hence, people who do not adjust their reference point as they lose are expected to take bets that they normally would find unacceptable. This analysis is supported by the observation that bets on long shots are most popular on the last race of the day (Tversky and Kahneman 1981 p. 456)."

Whyte (1989) provides a more general explanation of this phenomenon. Initially, a decision maker's reference point value is zero. Faced with a decision, the individual frames the decision as a choice between either gains or losses. If the person frames the decision as a loss, he or she will have moved on the value function from point A to point B (see Figure 2-2). Once at point B, a further loss of one unit does not seem as large in terms of subjective

value as does comparable gain of one unit. Consequently, an individual at point B is inclined to risk a further loss of one unit in order to obtain a possible gain of one unit. Compared to a person at point A, a person at point B is more likely to engage in risk seeking behavior.

Conversely, if the person frames the decision as a gain he or she will have moved on the value function from point A to point C. At point C, a further gain of one unit does not seem as large in terms of subjective value as does a comparable loss of one unit. Therefore, an individual is not inclined to risk a loss of one unit in order to obtain a possible gain of one unit. Compared to a person at point A, a person at point C is more likely to engage in risk averse behavior.

In many cases, decision makers choose among alternatives with more than one attribute. Tversky and Kahneman (1981) describe the framing and evaluation of these compound outcomes in terms of psychological accounts. A psychological account is defined as an outcome which specifies (1) the set of elementary outcomes that are evaluated jointly, and (2) a reference outcome that is considered neutral or normal. Transactions as a whole are evaluated as positive, negative or neutral depending on relevant factors.

Empirical research has found support for framing effects in an organizational context. For example, Schurr

(1987) has demonstrated the effects of framing in a negotiation and bargaining setting. He found that bargaining teams thinking "a gain is at stake" made less risky bargaining agreements than those thinking "a loss reduction is at stake". In an organizational buying context, Qualls and Puto (1989) examined hypotheses relating certain factors to the initial reference point, decision frame, and subsequent choice of buyers. Budget was significantly related to initial reference point, initial reference point was related to the decision frame, and the decision frame was related to subsequent choice. They found that buyers who framed alternatives as gains tended to choose the certain (sure thing) alternative, and buyers who framed the alternatives as losses tended to choose the risky (probablistic) alternative.

In summary, prospect theory proposes that organizational buyers probably evaluate alternative product/suppliers based on a frame of reference in their mind. Empirical evidence supports this contention. The manner in which they evaluate these alternatives is described by the value function. The value function implies that buyers may evaluate alternative product/suppliers in terms of gains or losses relative to some subjectively determined reference point. The value of this reference point has strong, predictable effects on the perceived attractiveness of out-

comes. If buyers evaluate alternatives using a positive decision frame, they will be likely to be risk averse in their preferences. Conversely, buyers who evaluate alternatives using a negative decision frame will be likely to be risk seeking in their preferences.

Conclusion

The purpose of this chapter was to: (1) summarize the marketing literature regarding individual versus group organizational buying under risk; (2) provide a brief explanation of the risky-shift phenomenon; (3) describe the group polarization hypothesis; (4) review the prominent theories used to explain group polarization; and, (5) review the commonly accepted theories of individual decision making under risk.

The results of this review indicate that for routine purchases individual buyers tend to make the buying decisions, while for more complex purchases such as new task buys, buying centers tend to make the procurement decisions. Individuals tend to make organizational procurement decisions under conditions which indicate low perceived risk and group decision making is common for situations characterized by high perceived risk.

In addition, research concerned with the relative influence of buying center participants has shown that the relative influence of buying center members changes as the

buying situation changes. Their findings suggest that the relative influence of buying center members change as result of environmental factors (e.g., environmental uncertainty), individual and organizational factors (e.g., personal consequences and bases of power), stage of the buying process, and buyclass.

Unfortunately, this research leaves us with a considerable knowledge gap. While it is meaningful to know how relative influence over the final choice decision changes under various circumstances, little is known about how this relative influence factors into the actual buying center's group choice. This research fails to examine the actual preferences and choices of the individual members before influence compared with the buying center's overall group choice after influence. Comparing individual member's preferences and choices with those of the buying center would allow us to have a better understanding of how influence processes relate to actual purchase choice.

The group polarization hypothesis proposes that after discussion, a group decision tends to be more extreme (in the same direction) than the individual initial tendency. If choice shift does occur in buying groups, it should operate in one of two possible directions. If the initial tendencies of group members is toward a cautious alternative, individual attitudes should polarize toward more extreme caution.

Conversely, if initial predispositions of group members is toward a risky alternative, individual attitudes should polarize toward more extreme risk.

While theories of normative and informational social influence adequately explain the mechanisms by which polarization during group interaction occurs, they do not offer any explanations or predictions about how an individuals' initial attitudes towards a risky prospect are formed. However, one of the most commonly accepted theories of individual decision making under risk (i.e., prospect theory) suggests that if a buyer frames a decision as a gain, he or she will tend to be risk averse and choose the cautious alternative. Conversely, a buyer who frames the decision as a loss will tend to be risk taking, and choose a risky alternative.

By combining theories of social influence and group polarization with prospect theory, it is possible to explain and predict (1) how initial individual buying center member attitudes toward a product/supplier are formed, and (2) the direction of their attitudes (i.e., towards risk or caution). Armed with this information it then becomes possible to explain and predict (3) the initial predispositions of the group (toward caution or risk), and (4) the direction and magnitude of polarization.

The next chapter will integrate theories of social

influence with prospect theory (individual decision making under risk) toward the objective of explaining and predicting buying center choices.

CHAPTER 3

THEORETICAL DEVELOPMENT

In the preceding chapter, a review of the literature in organizational buying behavior relating to individual versus group decision making under risk was presented. Marketing prescriptions suggest that under conditions of low risk (such as routine purchases) individual decision making is most appropriate, while under situations characterized by high risk (such as new task buys) group decision making is best.

Existing research on group dynamics has consistently shown a tendency for group preferences to polarize toward more extreme positions during group interaction. Given a predisposition toward a cautious alternative, polarization is toward more extreme caution. If the predisposition is toward risk, groups are polarized toward more extreme risk.

Prospect theory was shown to be a better explanation for the formation of an individual's initial propensity to be risk seeking or risk averse than expected utility theory. Unlike expected utility theory, prospect theory takes into account contextual factors that affect the decision making process. These contextual factors were shown to affect the decision frame used by the decision maker. Past empirical research has shown that knowledge of the decision frame used

by the decision maker may make it possible to predict the individuals predisposition toward risk or caution.

The objectives of this chapter are to: (1) illustrate the individual buyer's hypothetical choice formation process as proposed by Puto (1985), (2) integrate prospect theory with theories of social influence to illustrate the effect that multiple decision makers may have on the choice of a supplier by a buying center; (3) develop a conceptual model of buying center choice based on this conceptual integration; and (4) provide a set of testable hypotheses relating to the conceptual model.

Conceptual Integration

Figure 3-1 illustrates the hypothetical preference formation process, advancing from individual to buying center preference formation. The conceptual model is necessarily limited in the number of factors determining individual and group choice. Priority is given to those concepts that are of major interest in this research.

The top part of the model describes the individual organizational buying decision framing process and is adapted from Puto (1987). Puto (1987) found support for this basic model in two studies (Puto 1987, Qualls and Puto

1989). The bottom part of the model is an extension of the

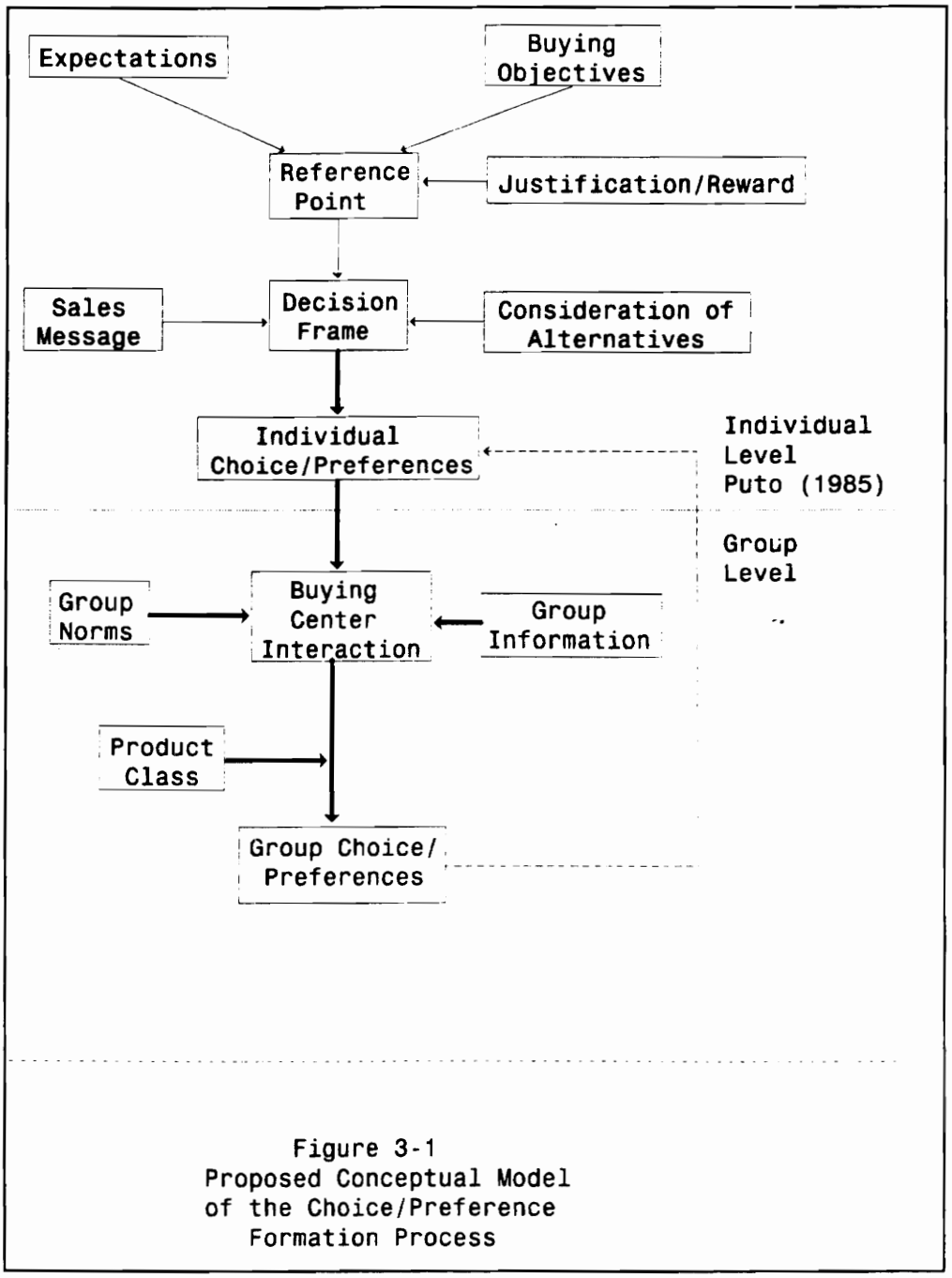

Figure 3-1
Proposed Conceptual Model
of the Choice/Preference
Formation Process

individual decision making process to buying centers. This extension accounts for group interaction within the buying center. The following section describes the elements of the conceptual model.

Individual Choice and Risk Preferences

At the individual level, the initial reference point of a buying center member is posited to be a function of two general factors: (1) the member's expectations of a product or supplier's performance, and (2) specific buying objectives that may be in force for a given procurement (Puto 1987). Buying center member's expectations and objectives are likely to vary with their organizational role. However, for the purpose of this research only the buyer's role will be discussed.

The buyer's expectations are derived from information available through past experience with the product or supplier. For example, the current price levels or delivery lead time might serve as the initial expectations for the purchase. Expectations are usually the result of the buyer's assessment of environmental conditions (Puto 1987).

Buying objectives are often external constraints, such as budgets, that are imposed on the buyer. They can be either ambitious objectives if based on hard to achieve targets, or conservative if based on easy to achieve targets (Puto 1985). As was previously noted, buying objectives can

vary among members of the buying center.

A specific buying objective and the buyer's expectations of future conditions (such as price trends) combine to form the initial reference point. This initial reference point becomes the standard by which alternative suppliers are compared.

Alternative suppliers are compared with the buyer's initial reference point. Should the supplier's offerings compare favorably with the initial reference point, the buyer's decision is framed as a gain. If the suppliers offers compare unfavorably with the initial reference point, the buyer's decision is framed as a loss.

The sales message used by the salesperson can affect the buyer's decision frame. A negative tint to a sales message, such as avoiding a loss to the competition, can lead to a negative decision frame. Conversely, a sales message that is cast in positive terms, such as gaining an advantage over the competition, can produce a positive decision frame (Puto 1985, 1987).

The buyer's choice must be justifiable in order to withstand post-decisional evaluation by superiors. This evaluation of job performance is related to the rewards or penalties the firm administers. Therefore, the firm's reward system may affect the viability of choosing an alternative product or supplier. If buying objectives are diffi-

cult to attain, the buyer is placed in a potential loss situation. If punishment for failure exceeds reward for success, then the buyer might adjust the initial reference point to a more easily attainable level (a more positive decision frame).

When the potential outcomes of the alternative suppliers are compared with the initial reference point, they will be framed as either gains or losses. Prospect theory proposes that choices among gains will tend to be risk averse, while choices among losses will tend to be risk seeking. Therefore, a buyer's individual choice (before the effect of group influence) for a supplier can be predicted to be risk averse or risk seeking depending upon how potential suppliers compare with the buyer's reference point.

Furthermore, we might also expect that a buyer's preference for certainty (i.e., risk preference) regarding a supplier's offer to vary with the decision frame. Prospect theory's predictions that buyers who frame decisions as a gain tend to choose a cautious alternative and those who frame decisions as a loss tend to choose a risky alternative. Choice is based on the subjective value of objectively determined gains or losses (i.e., the value function). If the value function holds, we would expect buyers who frame a decision as a loss to be more willing to accept risk associated with a decision than buyers who frame decisions

as a gain.

When the decision is framed as a loss, the subjective value associated with a further objective loss of one unit is less than the subjective value associated with a further gain of equal magnitude. The subjective value of a further objective loss is less than the subjective value of a further objective gain of equal magnitude for the risky prospect. Hence, we might expect buyers to be motivated to choose the risky supplier even if they are less certain of the risky supplier's offer, since the alternative choice is a sure loss.

Conversely, when a buyers decision is framed as a gain, the subjective value associated with a further objective gain of one unit is less than the subjective value associated with a further loss of equal magnitude. Here, the subjective value of a further objective gain is less than the subjective value of a further objective loss of equal magnitude for the risky prospect. Therefore, in order for a buyer to choose a risky supplier when the decision is framed as a gain, we might expect a buyer to require more certainty concerning the likely outcome of the risky supplier's offering.

These notions lead to the first two hypotheses, one concerning supplier choice and one concerning supplier preferences (i.e., the level of uncertainty a buyer is likely to

accept):

H1a: Gain frames lead individuals to relatively more cautious supplier choices and loss frames lead to relatively more risky supplier choices.

H1b: Gain frames lead individuals to relatively more risk averse preferences for suppliers and loss frames lead to relatively more risk seeking preferences for suppliers.

Of course, the amount of certainty that a buyer would require under a gain or loss frame condition can also be explained by the theory of perceived risk discussed earlier. The theory of perceived risk makes predictions opposite those of prospect theory, however.

Recall that the perceived risk felt by the buyer is posited to be a function of decision making uncertainty and the aversive consequences associated with a decision (Webster and Wind 1972, Sheth 1973). The function is proposed to be multiplicative where perceived risk equals uncertainty times consequences. This makes sense since we would expect the perceived risk felt by the buyer to be low when aversive consequences are low or zero, no matter how uncertain the buyer is. Furthermore, if the buyer is completely certain about a decision, we might expect their perceived risk to be low even if the aversive consequences of making a poor choice are high.

Under a gain frame condition, where for example all suppliers bids come in under the procurement budget, the aversive consequences associated with the decision are low.

Therefore, we might expect a buyer to be more willing to accept uncertainty in the supplier selection decision since perceived risk is low no matter what level of uncertainty the buyer has.

Under a loss frame condition, where for example all suppliers bids come in over the procurement budget, the aversive consequences associated with the decision are likely to be high. Therefore, we might expect the buyer to be less willing to accept uncertainty, since doing so would lead to high levels of perceived risk. Instead, we might expect the buyer to reduce decision making uncertainty in some way, in order to keep perceived risk at a low level. Note that these predictions are opposite those of prospect theory.

The following section describes the factors that determine whether a specific procurement decision will be made by an individual buyer or by a buying group.

Joint Versus Autonomous Decisions

The extent of a buyer's interaction with other members of the firm in a buying center is posited to be a function of the perceived risk of the buying decision. If the perceived risk of the purchase is high, the purchase is likely to be determined by a buying center. Two factors that are proposed to affect the perceived risk of a buying decision are the procurement buyclass and the decision time pressure.

Perceived Risk. Sheth (1973) proposed that one of the primary factors that determines whether a specific buying decision should be joint or autonomous is the perceived risk of a buying situation. Perceived risk refers to the magnitude of aversive consequences felt by the decision maker if he or she makes a wrong choice, and the uncertainty under which the decision must be undertaken. The greater the uncertainty associated with a purchase decision, the greater the perceived risk felt by the buyer. Other authors have also proposed that the greater the perceived risk, the more likely the purchase will be decided jointly (Raman 1992, Spekman and Johnson 1986).

The reasoning behind allocating risky decisions to buying centers is that a number of interested parties can bring together their relevant information or expertise, which will lower decision making uncertainty and lower the risk of aversive consequences to the firm (Bateson 1991, Hutt 1979, Spekman and Johnson 1986). Collins and Guetzkow (1964) postulated that effective interaction should allow groups to combine members' knowledge to produce higher quality decisions than would be made by the group's best member. This combination of knowledge from various group members leading to higher quality decisions is referred to as an *assembly bonus effect*.

A buyer who perceives that a specific procurement

involves high risk may informally consult with other members of the firm, or the decision of whether to allocate a high risk purchase to a group can be made at higher levels in the organization. In either case, high perceived risk may lead to group as opposed to individual procurement decisions (Anderson, Chu, and Weitz 1987; Johnson and Bonoma 1981).

The perceived risk of the buying decision is proposed to be a function of the buyclass (i.e., straight rebuy, modified rebuy, or new task buy), and decision time pressure.

Buyclass. The Robinson, Faris and Wind (1967) taxonomy of industrial purchases is based on three dimensions: (1) how unfamiliar the purchase situation is to the buyer, (2) how much information the buyer must gather to make a good decision, and (3) how seriously the buyer considers all possible alternatives. Since these dimensions are highly correlated, three combinations result (Anderson, Chu, and Weitz 1987). These three dimensions are new task buys, modified rebuys, and straight rebuys.

If the problem is new, the information requirements are high, and the consideration of alternatives is important, the buyclass is defined as a new task. If the problem is not new, information requirements are low, and no new alternatives are being considered, the buyclass is defined as a straight rebuy.

New task buys tend to be high risk buying situations and straight rebuys tend to be low risk buy situations. New tasks imply more risk in the decision because buying center members are largely unfamiliar with the task and they face a greater level of uncertainty (Wilson, Lilien and Wilson 1991). It is likely that the effect of buyclass on amount of group interaction is indirect, through its effect on a buyer's perceived risk. However, no one has examined the effect of buyclass on a decision maker's perceived risk.

Time Pressure. Sheth (1973) proposed that time pressure is one critical factor that determines whether an individual or a group will make a purchase decision. If a decision has to be made under great time pressure, it is more likely to be made by an individual rather than a group.

It is likely that decision time pressure's effect on whether a specific procurement decision will be joint or autonomous operates through its effect on a buyers perceived risk of the decision. As decision time pressure increases, an individual buyer may feel that he or she has less time to collect information to reduce decision-related uncertainty. Therefore, he or she may be more likely to rely on sources of information internal to the firm, especially other firm members with expertise. In fact, Kohli (1989) found that time pressure amplified the effect of expert power on manifest influence within the buying center. However, no one

has examined the role of time pressure on individual versus group decision making in organizational buying.

Although not modeled directly, the relationships between buyclass, time pressure, and perceived risk can be stated more formally in propositional form:

P1: New task buys and high decision time pressure tend to result in high perceived risk, while straight rebuys and low decision time pressure result in low perceived risk.

The perceived risk of a particular procurement is posited to determine whether the decision will be joint or autonomous.

P2: Low perceived risk will result in autonomous decision making and high perceived risk will result in joint decision making.

These assertions remain in propositional form since they will not be formally tested in the present study.

Summary. The first section proposed that a buying center member's initial reference point is affected by his or her expectations and buying objectives. This initial reference point, in conjunction with sales messages, the reward system of the firm, and alternative suppliers in the set, shape the decision frame used to form the individual buyer's prior preferences. The second section proposed that decision time pressure and buyclass combine to form a low or high level of perceived risk felt by the buyer. If perceived risk is low, the buyer may make an individual decision based on his or her prior preferences. However, if perceived risk is high

the buyer may seek advice or information from other members of the firm resulting in buying center interaction.

This study assumes that factors such as decision time pressure and buyclass combine to form a high level of perceived risk, resulting in buying center interaction for a specific procurement. Factors that are posited to affect the nature of this group interaction, and thus the resultant group decision include: (1) each buying center member's decision frame; (2) buying center norms; (3) information presented during the group discussion; as well as (4) the product class being purchased. The following section describes each of these factors and how they affect buying center interaction.

Buying Center Interaction

Buying center interaction refers to the assembly of individuals participating in a specific procurement decision where mutual influence takes place. If factors relating to the decision result in high perceived risk and joint decision making, either uniformity pressures to reach group consensus arise or coalitions may form. Social decision schemes are often used to model group interaction processes and explain how individual preferences for different outcomes are combined into a single group response (e.g. Wilson, Lilien, and Wilson 1991). A social decision scheme matrix contains the probabilities of a group's selecting one

of several alternatives, given a particular array of individual group member's responses across the same set of alternatives (Tindale and Larson 1992).

Coalition formation arising from group interaction can result in the bipolarization or depolarization of buying center members' preferences. Bipolarization occurs when the preferences of two coalitions within the group shift in opposite directions during group interaction. Depolarization occurs when the preferences of two coalitions within the group converge.

The explanation for bipolarization is based on social comparison processes (i.e., normative influence). Comparison with others' positions causes the group members in each coalition become more extreme in their positions. More extreme coalition positions results in bidirectional polarization. Persuasive arguments theory (i.e., informational influence) predicts the opposite result. Group discussion will facilitate the transmission of information which will reduce the gap between the two groups (i.e., depolarization). Whitney and Smith (1983) found support for these predictions, although their treatments and use of confederates may have been confounded. Neither bipolarization nor depolarization are examined in this study. The focus here is on the unidirectional polarization of preferences during consensus formation.

Buying center interaction provides one means by which mutual influence can lead to group convergence and consensus (Whyte 1989). The socially mediated change that is necessary for consensus to be achieved can occur through either normative influence, informational influence or both. Normative influence refers to a change in a buyers preferences based on his desire to be accepted by other members of the buying center. Informational influence refers to a change in a buyers preferences resulting from accepting evidence or facts provided during buying center discussion about the procurement. Both normative and informational influence processes have been found to cause the polarization of preferences in groups (see Isenberg (1986) for a review).

Consensus may also be achieved by means other than social influence. For example, Anderson and Chambers (1985) note that buying center rewards and hierarchical decision making can lead to consensus. They note however, that social influence is likely to play a predominant role in group consensus formation. Social influence processes are the only means to consensus examined in this study.

Influence processes operate by driving individuals holding minority positions toward the majority position held in a group (Nemeth 1986). Numerous studies have documented the fact that majorities exert more influence than do minor-

ities (see Tanford and Penrod 1984 for a review). Movement to the majority is based on two assumptions. One is that those individuals holding the minority position believe majority judgements give information about the decision issue and are likely to be correct (i.e., informational influence). The second assumption is that individuals want to be accepted and therefore wish to avoid the disapproval that emanates from maintaining a minority viewpoint (i.e., normative influence). The following section examines these influence processes more closely.

The Effect of Group Influence

Normative Social Influence

Normative influence is a process in which one takes on the positively valued attributes of a group in order to achieve a positive social identity (Turner 1991). Social comparison theory is one of the most widely accepted explanations of the process by which normative influence results in group polarization. Social comparison theory makes three basic assumptions about how buying center interaction can evoke choice shift. First, the typical buying center member is motivated to be at least as good if not better than the average member on a dimension rated as positive (such as cost savings to the firm). The positive dimension is introduced directly or indirectly into the characteristics of the buying task. Second, pluralistic ignorance (i.e., a lack of

knowledge concerning other members opinions) presides, in that before the buying center discussion all members presume that they load higher on the positive dimension or at least as high as the group average. Finally, buying center members who discover during the discussion that they do not meet or exceed the group standard, change their preferences for a supplier in the direction of the positive pole so that they meet or exceed the group standard (Zuber, Crott, and Werner 1992).

There is substantial agreement that individuals in cultures (such as organizations) are aware of the views, opinions, and behaviors that are valued in that culture (Hogg, Turner, and Davidson 1990). Individuals recognize that by being observed to be adhering to cultural standards or group norms they will be rewarded by social approval, or will avoid disapproval from others. When individuals come together to discuss an issue, their initial position on that issue will reflect this culturally preferred tendency. This same social approval motive ensures that, during group interaction, each individual expresses a more extreme position than their initial tendency (i.e., polarization) (Hogg, Turner, and Davidson 1990).

Normative influence is posited to cause the polarization of buying center member's preferences for a supplier. Before discussion with other members of the buying center,

individual buying center member's form their own opinions concerning the selection of a supplier based on the procurement decision frame, the available set of suppliers, etc. Entering into discussion with other buying center members concerning a procurement, the individual buyer is motivated to present himself or herself in a socially desirable light. Therefore, each member attempts to calculate the preferences of other members, and base his or her preferences on this calculation. Due to pluralistic ignorance however, each member underestimates the normative position of the buying group. During buying center discussion, each member learns the actual preferences of the other members and adjusts his or her preferences to be in line with the group norm. This adjustment of members of the buying center toward the perceived group norm is the polarization that is commonly observed.

The major thesis advanced in this research is that buying center discussion will reinforce the gain and loss implications predicted by prospect theory. That is, buying center member's preferences and choices for a risky or cautious supplier will become more extreme in the same direction as a result of buying center interaction. Buying center members preferences and choices will be more risk averse for procurement decisions framed as gains and more risk seeking for procurement decisions framed as losses than

the individual preferences and choices prior to buying center discussion.

Two studies have examined the effect of decision frames on the direction of group induced choice shift. McGuire, Kiesler, and Siegel (1987) found that eighty percent of the groups chose the cautious option when the decision was framed as a gain, and seventy-three percent of the groups chose the risky option when the decision was framed as a loss (consistent with prospect theory). Furthermore, as a result of face-to-face discussion, seventy-nine percent of subjects preferences polarized toward caution in the gain condition, while seventy-three percent of subjects polarized toward risk in the loss condition. However, computer-mediated discussion resulted in only forty-three percent of subjects polarizing toward caution in the gain condition, and fifty-three percent polarizing toward risk in the loss condition.

Neale et al. (1986) found the opposite result. Contrary to prospect theory and the thesis advanced herein, they found that individuals who framed the decision as a loss shifted toward caution and individuals who framed the decision as a gain shifted toward risk as a result of group influence. The following sections outline the theoretical arguments which describe the effect of a buyers decision frame on risk preferences and choice as well as the effect

of normative and informational influence on a buyers risk preferences.

Normative Influence/Gain Frame. If the buying objectives and expectations of individual buying center members results in a easy to achieve initial reference point, and alternative products or suppliers meet or exceed this reference point, then individual member choices are likely to be framed as gains. The framing of decision outcomes as gains is likely to lead to risk averse preferences and cautious choices. The individual buying center members are likely to prefer a conservative supplier.

Furthermore, if time pressure or buyclass heightens the perceived risk of the decision, leading to joint decision making, then individual buying center members are likely to compare their positions with those of other buying center members. This comparison may result in the polarization of the group's preferences toward even more extreme caution.

H2a: A gain frame and normative influence will cause a buying center's choice of supplier to shift toward more extreme caution.

H2b: A gain frame and normative influence will cause a buying center's risk preferences for a supplier to become more risk averse.

Normative Influence/Loss Frame. If the buying objectives and expectations of individual buying center members results in a hard to achieve initial reference point, and alterna-

tive products or suppliers fall short of this reference point, then individual member choices are likely to be framed as losses. The framing of decision outcomes as losses is likely to lead to risk seeking preferences and risky choices. The individual buying center members are likely to prefer a risky supplier.

Furthermore, if time pressure or the buyclass lead to heightened perceived risk and joint decision making, then individual buying center members are likely to compare their positions with those of other buying center members. This comparison may result in the polarization of the groups' choices and preferences toward even more extreme risk.

H3a: A loss frame and normative influence will cause a buying center's choice for a supplier to shift toward more extreme risk.

H3b: A loss frame and normative influence will cause a buying center member's risk preferences for a supplier to become more risk seeking.

Informational Social Influence

Polarization may also be due to the preponderance of information presented in the predominant group position. Informational influence is the process by which one thinks about, understands, and processes deeply, ideas and the core arguments that underlie them (Turner 1991). The persuasive arguments theory of informational influence holds that an individual's initial choice or position on an issue is a

function of the number of pro or con arguments that the person recalls from memory when formulating his or her opinion (Isenberg 1986). Group discussion causes an individual to shift in a given direction to the extent that the discussion exposes that individual to persuasive arguments favoring that direction.

Persuasive arguments theorists argue that in order for an individual to make a decision or state a position on an issue, he or she must draw upon a subjectively available pool of pro and con arguments. Through discussion with others, individuals are exposed to an expanded pool of novel pro and con arguments. To the extent that the group as a whole initially has a clear tendency to favor one side or the other of an issue, the expanded pool will contain more novel arguments favoring that tendency. These novel arguments supporting one's own position result in increased support for, and greater confidence in, one's original tendency, which is expressed as more extreme endorsement of that tendency (i.e., polarization) (Hogg, Turner, and Davidson 1990).

Two factors determine how persuasive an argument will be (Isenberg 1986). One factor is the perceived validity of the argument. Validity refers to the truth content of the argument, or how logical the argument is. The second factor that determines persuasiveness is the perceived novelty of

the argument. Novelty refers to the newness of ideas or the newness of ways to organize information. Together, the perceived validity and novelty of an argument determine how influential that particular argument will be in causing a choice shift. The following sections describe the effect of gain and loss frames in conjunction with informational influence.

Informational Influence/Gain Frame. If the buying objectives and expectations of individual buying center members result in an easy to achieve initial reference point, and alternative products or suppliers meet or exceed this reference point, then individual member choices are likely to be framed as gains. The framing of decision outcomes as gains is likely to lead to cautious choices and risk averse preferences. The individual buying center members are likely to prefer a conservative supplier.

Furthermore, if time pressure and buyclass heighten the perceived risk of the decision leading to joint decision making, and a large number of novel, valid arguments are presented during group interaction, then the group's preferences and choices may become polarized toward even more extreme caution.

H4a: A gain frame and informational influence will cause a buying center's choice of supplier to shift toward more extreme caution.

H4b: A gain frame and informational influence will cause a buying center member's risk preferences for a supplier to become more risk averse.

Informational Influence/Loss Frame. If the buying objectives and expectations of individual buying center members results in a hard to achieve initial reference point, and alternative products or suppliers fall short of this reference point, then individual member choices are likely to be framed as losses. The framing of decision outcomes as losses is likely to lead to risk seeking preferences. The individual buying center members are likely to choose a risky supplier.

Furthermore, if time pressure and the buyclass lead to heightened perceived risk and joint decision making, and a large number of novel, valid arguments are presented during group interaction, then the groups choices and preferences may become polarized toward even more extreme risk.

H5a: A loss frame and informational influence will cause a buying center's choice of supplier to shift toward more extreme risk.

H5b: A loss frame and informational influence will cause a buying center member's risk preferences for a supplier to become more risk seeking.

The predicted direction of a preference shift resulting from buying center interaction is posited to be the same regardless of whether the shift is induced by normative or

informational influence. That is, gain frames and normative or informational influence result in a shift toward more extreme caution. Loss frames and normative or informational influence result in a shift toward more extreme risk.

Context Effects. One contextual, procurement-related factor that is posited to impact the effectiveness of informational and normative influence in inducing a shift in risk preferences and choice is whether the procurement product class is goods-based or service-based. Industrial goods are physical objects that have value to the firm, whereas industrial services are activities that have value to the firm (Brown and Fern 1981).

The fundamental differences between services and goods are commonly accepted to be the intangibility of services, the simultaneity of production and consumption, the heterogeneity of service outputs (i.e., services are less standardized), and their perishability (Berry 1980, Zeithaml, Parasuraman, and Berry 1985). The fundamental difference is proposed to be intangibility. Since services are performances rather than objects, they cannot be seen, felt, tasted, or touched in the same manner in which goods can be sensed.

The simultaneity of production and consumption means that services are first sold, then produced and consumed simultaneously. On the other hand, goods are first pro-

duced, then sold and then consumed. The result is that the consumer has to be present during the production of many services (e.g., haircuts) which forces the buyer into intimate contact with the production process.

Heterogeneity refers to the potential for high variability in the performance of service outputs, relative to goods. Standardized production processes limit the variability of goods. However, services are unique in that the quality can vary from producer to producer, from customer to customer, and from day to day (Zeithaml, Parasuraman, and Berry 1985).

Finally, perishability means that services cannot be stored or saved. Foregone sales from airline seats not purchased and motel rooms not occupied are lost forever. This contrasts with goods that can be inventoried, and simply sold at a future point in time.

These qualitative differences (i.e., intangibility, inseparability, heterogeneity, and perishability) are thought to elicit distinctive behavior on the part of buyers since a service's intangibility, perishability, and heterogeneity result in less of an ability on the part of the buyer to predict the quality of service being purchased. Therefore, perceived risk may be high (Bateson 1992).

Parasuraman, Zeithaml, and Berry (1985) suggest that a buyer's ability to obtain knowledge of alternative product

offerings depends on the nature of the attributes of the product. Drawing from the economics literature, they identify three types of attributes: search attributes, experience attributes, and credence attributes that buyers can use to evaluate alternative product offerings.

Search attributes are those that can be evaluated before the purchase. Information on these attributes can be obtained by asking questions of salespeople or references or by looking up information. Experience attributes are those that cannot be evaluated until after a service has been received. For example, the quality of a haircut or the speed of dry cleaning can only be assessed after the service has been delivered. Credence attributes are those that cannot be evaluated confidently even immediately after receipt of the service. In other words, credence attributes are experienced over time and often cannot be evaluated until sometime after receiving the service. Credence attributes are common in technical consultancies (Bateson 1992).

Since services are intangible, heterogeneous, etc., it is often difficult for buyers to objectively evaluate a service before it is bought. That is, services have few search attributes relative to goods. Furthermore, a large proportion of the properties of a service can be discovered by buyers only after the consumption of the service (i.e.,

buyers evaluate services by using experience attributes). Finally, the properties of many services, such as how well maintenance and repair has been carried out, may not be assessed even after the service is completed (i.e., credence attributes). The low levels of search, and credence attributes of services relative to goods may inhibit the reduction of decision making uncertainty for services compared to goods. Since uncertainty could be higher for service purchases than for goods purchases, there may be heightened perceived risk for service procurements versus goods procurements.

These characteristics of services (i.e., low search and credence attributes and equal experience attributes) relative to goods, as well as the notion that the benefits of a service are primarily derived from an interactive process or experience (due to the inseparability of production and consumption) suggest that a buyer's overall service evaluation may be primarily based on the service experience as opposed to a more objective evaluation that compares products on an attribute by attribute basis.

Laughlin and Earley (1982) have proposed that many of the issues on which groups make decisions can be located along a continuum. At one end of this continuum are *intellective* issues for which there are, or are considered to be, demonstrably correct answers. At the other end of

the continuum are *judgmental* issues for which there are no demonstrably correct answers.

A buyer's evaluation of a good may be more straight forward than for a service, such as when two goods are compared to each other on an attribute by attribute basis. In this case, each attribute could be objectively measured (as in comparing product specifications) and a buyer might pick the good that rates highest on the attribute(s) most important to him/her. This situation is analogous to the intellective issues discussed by Laughlin and Earley (1982).

On the other hand, a buyer's evaluation of a service tends to be more experiential rather than objective in nature. Here, it is likely that the service experience is what the buyer uses to evaluate the quality of the service. This type of evaluation is more analogous to the judgemental issues discussed by Laughlin and Earley (1982).

Kaplan and Miller (1987) found support for the hypothesis that informational influence would predominate when the issue is intellective, and normative influence would predominate when the issue is judgmental. Items that are less susceptible to social comparison should be those relating to matters of fact.

To the extent that goods procurements are relatively more intellective tasks and service procurements are rela-

tively more judgmental tasks, the following predictions are offered:

H6a: A gain frame and informational influence will cause a buying center's choice of a supplier to shift more toward caution than a gain frame and normative influence for the procurement of goods.

The findings of Kaplan and Miller (1987) suggest that informational influence should predominate when the decision issue is intellective in nature. If this is true, then we would expect that informational influence should have a greater effect on choice shift than normative influence. To the extent that good procurement decisions are more intellective and service procurement decisions are more judgemental, we might expect that informational influence would have a greater effect on choice shift than normative influence for the procurement of goods.

When a group decision is framed as a gain, the direction of this choice shift is posited to be toward more caution for both informational and normative influence. Here, the hypothesis combining the two factors is that the magnitude of the choice shift should differ. The cautious choice shift for the effect of a gain frame and informational influence should be greater than the cautious choice shift for the effect of a gain frame and normative influence when the procurement is goods-based.

In addition, we might also expect that the amount of

risk that a buyer is willing to accept in the decision to be affected the same way as the buyer's choice. Informational influence should predominate (i.e., have a greater effect) on risk preference shift then normative influence for the procurement of goods. Given a gain frame, this effect should be toward less risk.

H6b: A gain frame and informational influence will cause a buying center's risk preferences for a supplier to become more risk averse than a gain frame and normative influence for the procurement of goods.

When the buyer is faced with a procurement decision that is framed as a loss however, the choice shift should be in the opposite direction. That is, a loss frame and informational influence should produce a choice shift toward greater risk than a loss frame and normative influence for a goods procurement decision.

H6c: A loss frame and informational influence will cause a buying center's choice of a supplier to shift more toward risk than a loss frame and normative influence for the procurement of goods.

In addition, we might also expect that the amount of risk that a buyer is willing to accept in the decision to be affected the same way as the buyer's choice. That is, informational influence should predominate (i.e., have a greater effect) on risk preference shift then normative influence for the procurement of goods. Given a loss frame, this effect should be toward more risk.

H6d: A loss frame and informational influence will cause a buying center's risk preferences for a supplier to become more risk seeking than a loss frame and normative influence for the procurement of goods.

To the extent that service procurement decisions are more judgemental and good procurement decisions are more intellective, we might expect that normative influence would have a greater effect on choice shift than informational influence for the procurement of services.

When a group decision is framed as a gain, the direction of this choice shift is posited to be toward more caution for both informational and normative influence. Here, the hypothesis combining the two factors is that the magnitude of the choice shift should differ. The cautious choice shift for the effect of a gain frame and normative influence should be greater than the cautious choice shift for the effect of a gain frame and informational influence when the procurement is service-based.

H7a: A gain frame and normative influence will cause a buying center's choice of a supplier to shift more toward caution than a gain frame and informational influence for the procurement of services.

In addition, we might also expect that the amount of risk that a buyer is willing to accept in the decision to be affected the same way as the buyer's choice. That is, normative influence should predominate (i.e., have a greater effect) on risk preference shift then informational influence for the procurement of services. Given a gain frame,

this effect should be toward less risk.

H7b: A gain frame and normative influence will cause a buying center's risk preferences for a supplier to become more risk averse than a gain frame and informational influence for the procurement of services.

When the buyer is faced with a procurement decision that is framed as a loss however, the choice shift should be in the opposite direction. That is, a loss frame and normative influence should produce a choice shift toward greater risk than a loss frame and informational influence for a service procurement decision.

H7c: A loss frame and normative influence will cause a buying center's choice of a supplier to shift more toward risk than a loss frame and informational influence for the procurement of services.

Finally, we might also expect that the amount of risk that a buyer is willing to accept in the decision to be affected the same way as the buyer's choice. That is, normative influence should predominate (i.e., have a greater effect) on risk preference shift then informational influence for the procurement of goods. Given a loss frame, this effect should be toward more risk.

H7d: A loss frame and normative influence will cause a buying center's risk preferences for a supplier to become more risk seeking than a loss frame and informational influence for the procurement of services.

This concludes this chapter on theoretical development. The next chapter discusses the research method that was used to test the hypotheses developed herein.

CHAPTER 4

RESEARCH METHOD

This chapter describes the research design and the procedures that were used in collecting and analyzing the data gathered during the experiments. The design section includes a discussion of the subjects, experimental procedure, factors, stimuli, and measures used in the study. The analysis section describes the procedure used in testing the hypotheses and presenting the results.

Research Design

The research involved two concurrent laboratory experiments each containing two conceptual manipulated factors: decision frame and influence type. In addition, two operational factors were introduced into the experiment to maintain the realism of the buying scenarios. They included a performance and financial attribution for uncertainty and the two buying scenarios (i.e., two product scenarios and two service scenarios) within which the experimental manipulations were imbedded. One experiment was a goods procurement and the other experiment was a service procurement. The resulting experiments were both partially confounded factorial designs.

Subjects. The subjects used in the laboratory experiments were students enrolled in the R.B. Pamplin College of Busi-

ness at Virginia Polytechnic Institute and State University. Subjects age varied from 19 to 42 years. The mean age of subjects was 21.89 years. One hundred twenty (46.9%) of the students in the sample were female, while one hundred thirty-six (53.1%) were male. Eighty-eight subjects (34.4%) reported that they were juniors, one hundred sixty-one (62.9%) said they were seniors, and seven students (2.7%) were graduate students.

Sample Size. The sensitivity of the experimental design is the likelihood that an effect, if present, will be detected Lipsey (1990). Sensitivity depends on the effect size or magnitude of the "real" effect to be detected, the sample size, subject heterogeneity, experimental error, measurement error, and the power of data analysis techniques. The sample size used in this study is based on the expected effect size of the main hypotheses guiding this study - those concerning polarization. A recent meta-analysis conducted by Isenberg (1986) provided the initial data used as input for the effect size calculations (see Table 4-1).

The effect sizes were calculated based on the formula $ES = 2r/\sqrt{(1-r^2)}$ (Lipsey 1990). These effect sizes, along with their associated degrees of freedom at an alpha level of .05 for a one tailed test, were used to estimate the power of each test. These estimates were derived from power tables found in Lipsey (1990).

For normative influence studies, the average effect size was estimated to be 1.0 with an associated average power of .805. Reference to the power tables indicated that,at an alpha level of .05 for a one-tailed test, the sample size per cell should be thirteen. Considering there are eight cells in the research design, this translates to a total sample size of one hundred and four.

For informational influence studies, the average effect size was estimated to be 2.6 with an associated average power of .872. Reference to the power tables indicated that, at an alpha level of .05 for a one tailed test, the sample size per cell should be four. Given there are eight cells in the design, this results in a total sample size of thirty two.

If the smaller sample size of thirty two were selected for this study, a bias towards acceptance of the informational influence explanation over the normative influence explanation could occur. This is because the power to detect a normative influence effect would be much lower than the power to detect an informational influence effect (approximately .48 versus .90 respectively). In order to eliminate this potential bias, a larger sample size (i.e., 256) was selected for this study.

Table 4-1
Effect Sizes for Recent Group Polarization Studies
on Normative and Informational Influence

Study #	r	df	Effect Size	Power
Normative Influence Studies				
1	.41	44	.899	.98
2	.43	39	.953	.94
3	.12	23	.242	.12
4	.21	23	.429	.29
5	.37	14	.796	.54
6	.74	7	2.200	.97
7	.39	17	.847	.65
8	.29	27	.606	.58
9	.57	27	1.380	.99
10	.52	24	1.217	.98
11	.36	24	.772	.70
12	.63	14	1.622	.98
13	.27	102	.561	.97
14	.44	102	.979	1.00
15	.33	116	.699	.99
16	.52	18	1.217	.95
17	.86	18	3.370	1.00
18	.43	27	.952	.94
19	.17	265	.345	.98
20	.51	18	1.185	.94
21	.37	11	.796	.41
Informational Influence Studies				
1	.68	22	1.854	.96
2	.39	252	.847	1.00
3	.65	9	1.171	.93
4	.98	3	9.840	1.00
5	.44	88	.979	1.00
6	.53	88	1.250	1.00
7	.67	140	1.805	1.00
8	.51	13	1.185	.99
9	.57	4	1.387	.49
10	.86	3	3.370	.70
11	.93	3	5.060	.70
12	.84	3	3.096	.70

Source: Isenberg (1986)

In all, one hundred twenty-eight subjects were used in the product procurement and one hundred twenty-eight in the service procurement experiments. Each experimental group was composed of four subjects. Therefore, thirty-two groups were run for each experiment.

Experimental Stimulus Development. The experimental stimulus contained the independent variable manipulated factors and the dependent variable measures. The stimulus was composed of two procurement scenarios. The scenarios were developed to simulate purchasing cases in a university setting. In order to achieve realism, three one-hour personal interviews were conducted with actual buyers in the Purchasing Department at Virginia Polytechnic Institute and State University. During these interviews, several aspects of recent procurements were discussed, including the procurement process, the involvement of various buying center members in each procurement, the product classes being purchased, and how monetary value of the purchase varied the procurement process.

Two main objectives of the personal interviews were: (1) to verify that the theoretical notions advanced in this research possibly operated in organizational buying; and (2) to obtain realistic purchasing scenarios within which the independent variables could be imbedded. The consensus opinion of the buyers interviewed was that the inclusion of

many individuals in the buying process does have an effect on purchasing choice, and that in many cases a group choice can be suboptimal to an individual choice.

From the interviews, eight procurement scenarios were developed, four goods-based purchasing scenarios and four service-based purchasing scenarios. The goods-based scenarios included a musical instrument procurement for the Music Department, a projector panel procurement for the Audio-visual Department, a uniform procurement for the Athletic Department, and a copying machine procurement for various colleges in the university. The service-based scenarios included a general contracting construction service procurement for a new maintenance shed on campus, a printing service procurement for football schedules for the following year, a repair and maintenance service for personal computers on campus, and a collection service procurement for collecting on defaulted student loans.

The decision frame manipulation was then imbedded in each hypothetical procurement scenario. Figure 4-1 illustrates how a loss decision frame was imbedded in the procurement scenario. Figure 4-2 shows the same scenario with a gain frame. Three points should be noted with respect to the decision frame manipulations. First, the expected value of the certain supplier's bid equals the expected value of the risky supplier's bid for both loss and gain frame manip-

ulations (i.e., $450,000 = (.5 x $410,000) + (.5 x $490,000) and $270,000 = (.5 x $230,000) + (.5 x $310,000). Second, the outcome differences between the risky and cautious supplier bids are identical in both the gain and loss frame conditions (i.e., $450,000 - $410,000 = $40,000, $490,000 - $450,000 = $40,000, $270,000 - $230,000 = $40,000, $310,000 - $270,000 = $40,000. Finally, the reference point differs between the loss and gain scenarios (i.e., loss budget = $370,000 and gain budget = $350,000). However, according to prospect theory choices are evaluated according to gains or losses with respect to an initial reference point (i.e., on a relative basis) rather than on an absolute scale. If this is true, the reference point differences will have no effect on supplier choice.

The next step in the development of the scenarios was to pretest the gain and loss frame manipulations that were developed. The objective of this pretest was to determine whether individuals could reasonably identify the main variable (i.e., decision frame) upon which the scenarios differed. Four of the five marketing doctoral students asked to categorize the scenarios correctly differentiated between the scenarios by stating that some scenarios were over and others under the procurement budget. Based on these results, the next step was to develop the entire experimental booklet.

==========

The Media Services Division of Virginia Tech has recently requested software projector panels so that computer graphics can be displayed on existing overhead machines. The purchasing department issued requests for proposals for software projector panels to several manufacturers. Only two of the software projector panel manufacturers met bid specifications.

As the buyer for audio-visual products for Virginia Tech you must select one company to provide the thirty-two software projector panels. The LCD panel budget has been set at $370,000.

One manufacturer, A-V Equipment and Supplies, will provide the panels for what is considered to be a certain bid price of $450,000. A second manufacturer, Boxlight, will provide the same quality projector panels for what is considered to be an uncertain bid price of $410,000.

You have contacted some of Boxlight's previous customers. Half of the previous customers said that Boxlight had no trouble meeting deadlines, and the other half said there may be some trouble. If deadlines are not met, it could result in a cost of $490,000.

As you can see, the cost to the university will be over the budget of $370,000 resulting in a budget deficit. Depending on the supplier chosen, the cost to the university could be either:

1) A-V Equipment and Supplies - $450,000 certain bid.
2) Boxlight - Either $410,000 or $490,000 depending on Boxlight's performance.

Figure 4 - 1
Illustration of a Goods-Based Loss Frame Manipulation

==========

The Media Services Division of Virginia Tech has recently requested software projector panels so that computer graphics can be displayed on existing overhead machines. The purchasing department issued requests for proposals for software projector panels to several manufacturers. Only two of the software projector panel manufacturers met bid specifications.

As the buyer for audio-visual products for Virginia Tech you must select one company to provide the thirty-two software projector panels. The LCD panel budget has been set at $350,000.

One manufacturer, A-V Equipment and Supplies, will provide the panels for what is considered to be a certain bid price of $270,000. A second manufacturer, Boxlight, will provide the same quality projector panels for what is considered to be an uncertain bid price of $230,000.

You have contacted some of Boxlight's previous customers. Half of the previous customers said that Boxlight had no trouble meeting deadlines, and the other half said there may be some trouble. If deadlines are not met, it could result in a cost of $310,000.

As you can see, the cost to the university will be under the budget of $350,000 resulting in a budget surplus. Depending on the supplier chosen, the cost to the university could be either:

1) A-V Equipment and Supplies - $270,000 certain bid.
2) Boxlight - Either $230,000 or $310,000 depending on Boxlight's performance.

Figure 4 - 2
Illustration of a Goods-Based Gain Frame Manipulation

Experimental Stimulus. The stimulus was an experimental booklet that contained the following components in order of appearance: (1) instructions; (2) a prologue; (3) the first procurement scenario; (4) the first questionnaire; (5) the second procurement scenario; (6) the second questionnaire; (7) concluding comments by buyers.

The opening instructions served two purposes in the experiment, to provide the guise for the experiment and to prime the subjects. First, the instructions contained the experimental guise. The experimental guise was designed to be meaningful to the undergraduate student sample used in the experiment so that they would become involved in the experiment. An industrial marketing case development project guise was used to achieve this objective. Second, the instructions primed the subjects. One objective of priming was to get the students to role play and imagine that they were buyers for Virginia Tech. Another objective was to provide performance evaluation criteria the students could use to base their purchasing decisions on. The performance evaluation criterion used in these experiments was cost reduction.

The second page of the experimental booklet contained the prologue. The prologue was inserted so that subjects would read and complete all experimental work in the order in which it was presented. A second purpose of the prologue

was to identify subjects.

Independent Variables. The first and second procurement scenarios contained the decision frame manipulations. In one experiment, subjects respond to two product scenarios (i.e., musical instrument or audio-visual procurements). In the other experiment, subjects responded to two service scenarios (i.e., collection agency or printing service procurements). These four scenarios were selected from the eight possible scenarios originally developed because they seemed more relevant to students. Furthermore, if eight scenarios were used, the experiment would become exponentially more complex and the sample size would have to have been doubled.

The sample booklet in Appendix 1 shows the two product procurement scenarios and Appendix 2 shows the two service procurement scenarios used in the experiments. For products, twenty-five percent of the subjects received the musical instrument procurement scenario first and the audio-visual procurement scenario second. Twenty-five percent of subjects received the audio-visual (i.e., product) procurement scenario first and the musical instrument procurement scenario second. For services, twenty-five percent of subjects received the collection agency (i.e., service) procurement first and the printing service procurement second. Finally, twenty-five percent of subjects received the printing ser-

vice procurement first and the collection agency procurement second. Appendix 2 shows the service procurement scenarios used in the experiment. As was previously stated, these different scenarios became operational independent variables in the analysis of variance.

The *decision frame manipulation* was imbedded in the procurement scenarios. Decision frame was manipulated by having the supplier's bids either over the procurement budget (loss frame) or by having the supplier's bids under the procurement budget (gain frame). Appendix 1 shows the gain frame manipulation for the first procurement (i.e., musical instrument) scenario and the loss frame manipulation for the second procurement (i.e., audio-visual) scenario.

Pretests were conducted to ascertain the extent to which the decision frame manipulations caused subjects to change their supplier choices. The first pretest involved six subjects responding to both the gain and loss frame scenarios. The subjects used in the pretest were undergraduate business students at Virginia Tech, and were similar to those used for the main study.

Since this test involved dependent observations and nominal scale data, the McNemar Test for Significant Change was used (Hinkle, Wiersma, and Jurs 1979). With this test, the null hypothesis being assessed is that there will be an equal number of changes in both directions. That is, when

the decision frame is changed from a gain frame to a loss frame there will be an equal number of subjects initially choosing the cautious supplier who switch to a risky supplier as those who initially choose the risky supplier and switch to the cautious supplier. This implies that the expected frequency of cell A will be the same as the expected frequency of cell D. Results of this pretest are presented in Table 4-2.

Table 4-2
First Pretest Results - Decision Frame Manipulation

First Exposure - Gain Frame Manipulation				
		Cautious Choice	Risky Choice	Row Total
Second Exposure-Loss Frame	Risky Choice	**A** 3	**B** 1	4
	Cautious Choice	**C** 2	**D** 0	2
	Column Total	5	1	6

At alpha = .10, the McNemar Chi-square Test for Significance of Change results suggest that the null hypothesis of equal number of changes in both directions can be rejected

($X^2 = 3$, df = 1, $p < .10$)[1]. Inspection of the data reveals that more subjects changed from a cautious supplier choice to a risky supplier choice than from a risky supplier choice to a cautious supplier choice when the decision frame changed from a gain to a loss.

A second pretest was conducted to replicate the first pretests results, since the sample size was so small. Again, undergraduate business students at Virginia Tech were used since they are similar to the subjects that were to be used in the main study. Table 4-3 presents the results from the second pretest on 28 subjects.

Again the McNemar Test for Significant Change was applied to the data. Results from this test suggest that the null hypothesis of an equal number of changes in both directions can be rejected ($X^2 = 3.2$, df = 1, $p < .10$). Data inspection reveals that a majority of subjects initially chose the cautious supplier under a gain frame and then switched to the risky supplier under the loss frame condition. Based on these results, the decision frame manipulation seemed to work as expected.

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[1]The null hypothesis is that there will be an equal number of changes in both directions. This implies that the expected cell frequency in cell A will equal the expected frequency in cell D. Therefore, the expected value for both cells A and D is $(A + D)/2$. The test statistic is then computed as $X^2 = (A + D)^2/(A + D)$ (Hinkle, Wiersma, and Jurs 1979).

Table 4-3
Second Pretest Results - Decision Frame Manipulation

		First Exposure - Gain Frame Manipulation		
		Cautious Choice	Risky Choice	Row Total
Second Exposure-Loss Frame	Risky Choice	14	2	16
	Cautious Choice	6	6	12
	Column Total	20	8	28

These same pretested budget manipulations were used in both the product and service procurement scenarios. All subjects were exposed to both the gain and loss frame manipulations. Half of the subjects exposed to the musical instrument procurement scenario first received the gain frame manipulation and half received the loss frame manipulation. Half of the subjects exposed to the audio-visual procurement scenario first received the gain frame manipulation and half received the loss frame manipulation. Half of the subjects exposed to the collection service scenario first received the gain frame manipulation and half received the loss frame manipulation. Half of the subjects exposed to the printing service first received the gain frame manipulation and half

received the loss frame manipulation. The purpose of all these crossed factors was to eliminate rival explanations. We did not expect any differential effects for the order of presentation of the scenarios.

The procurement scenarios contained an attribution for uncertainty for the risky supplier. Appendix 1 shows that for the musical instrument scenario, the attribution was financial stability. For the audio-visual scenario the attribution was performance uncertainty. The attributions for uncertainty were the same for both the product and service procurement experiments. All subjects were exposed to both the financial attribution and performance attribution for uncertainty. Half of the subjects exposed to the musical instrument scenario first received a financial attribution for uncertainty and half received a performance attribution. Half of the subjects exposed to the audio-visual scenario first received a financial attribution for uncertainty and half received a performance attribution. Half of the subjects exposed to the collection service scenario first received a financial attribution for uncertainty and half received a performance attribution. Half of the subjects exposed to the printing service scenario first received a financial attribution and half received a performance attribution. Once again, the attribution for uncertainty was included as an operational independent variable

in the analysis of variance.

Finally, after completing both procurement scenarios and responding to the dependent variable questions, subjects were exposed to the influence manipulation. The *influence manipulation* was either normative or informational. Recall that normative influence is conformity based on an individual's desire to be accepted by others. Therefore, a series of statements were presented to the subjects that identified four Virginia Tech buyer's preferences for each procurement scenario. For example, normative influence was presented to the subjects as the preferences of four actual buyers at Virginia Tech concerning the procurements the subjects had just reviewed.

Informational influence is conformity that results from accepting facts presented by others about the procurement situations. Therefore, informational influence was operationalized as a set of four persuasive arguments presented by actual buyers with informational content (see Appendix 4 for a sample of the influence manipulations).

A pretest was conducted to see if the influence manipulations would result expected behavior on the part of the subjects. The expected behavior was that subjects in a gain frame condition would shift their choices toward the cautious supplier choice when exposed to normative or informational influence. Also, that subjects in the loss frame

condition would shift toward the risky supplier when exposed to normative or informational influence.

A sample of 26 undergraduate business students at Virginia Tech was used for the influence pretest since they were thought to be similar to those that would be used in the main study. Thirteen subjects chose either a cautious or risky supplier when exposed to both the gain and loss frame procurement scenario's. Next the subjects were exposed to the influence manipulation and met as a group to discuss the purchase situations. Half (13) of the subjects were exposed to informational influence and half (13) were exposed to normative influence. Finally, they made the supplier choice a second time. Table 4-4 shows the results from the pretest.

In order to make Table 4-4 meaningful, it is necessary to recall that subjects choices were coded as the cautious supplier (1) or the risky supplier (2). Table 4-4 shows that the effect of informational influence under a gain frame resulted in subjects choices shifting toward more caution and this effect was significant, using a t-test for dependent means ($t = 1.39$, $df = 12$, $p < .10$). The effect of informational influence under a loss frame was also significant and in the right direction ($t = -1.90$, $df = 12$, $p < .10$). However, the effect of normative influence under the gain frame was in the wrong direction and was not signifi-

cant ($t = -1.00$, $df = 12$, $p > .10$). Finally, the effect of normative influence under the loss frame was as expected ($t = -1.39$, $df = 12$, $p < .10$). Therefore, it was concluded that the influence manipulations seemed to work fairly well.

Table 4-4
Means and (Standard Deviations) for Pretest 3 - Effect of Normative and Informational Influence on Supplier Choice Shift

	Informational Influence	
	Gain Frame	Loss Frame
Before Influence	1.3846 (.506)	1.3077 (.630)
After Influence	1.1538 (.555)	1.5385 (.519)
	Normative Influence	
	Gain Frame	Loss Frame
Before Influence	1.3846 (.506)	1.3077 (.630)
After Influence	1.4615 (.519)	1.5385 (.519)

Experimental Procedure. Subjects were admitted into the laboratory conference room in groups of four. Each group was initially seated around a conference room table where they received instructions from the experimenter. The

experimenter explained that the subjects were about to make some procurement decisions for Virginia Polytechnic Institute and State University and that they should imagine that they were buyers for the school. Each group was randomly assigned to one of the eight experimental conditions shown in Table 4-5.

Subjects were next escorted into individual rooms where each received identical experimental stimuli (see Appendix 1 for a sample of the stimuli). Appendix 3 shows the experimental plan. Subjects were randomly assigned to the conditions shown in Appendix 3 using the random number table found in Churchill (1978).

Table 4-5
Experimental Conditions

Product							
Good				Service			
Frame							
Gain		Loss		Gain		Loss	
Influence Type							
Info	Norm	Info	Norm	Info	Norm	Info	Norm
1 n=32	2 n=32	3 n=32	4 n=32	5 n=32	6 n=32	7 n=32	8 n=32

Dependent Variables. The *choice of supplier* was identified by asking the subjects to respond to the question: "Which supplier would you choose for the job?" To which the subject could choose either the cautious supplier (1) (with the certain, higher bid) or the risky supplier (2) (with the lower, but uncertain bid). This question appeared immediately following the first and second buying scenarios and before the subject was exposed to the influence manipulation.

The subjects' *risk seeking propensity* was measured by asking the question: "How certain does Klavenspiel's (the risky supplier) lower bid price have to be for you to contract with them?" Subjects responded to this question on a zero to one hundred percent magnitude scale (anchored by "Completely uncertain" and Completely certain"). The magnitude scale was developed for two reasons. First, experimental pretests revealed that a seven-point Likert scale was not sensitive enough to detect small changes in the subjects risk seeking propensity. Second, pretests revealed that subjects could more easily recall which number they had chosen on previous scenarios, and would simply repeat their previous choices. With the magnitude scale, subjects placed a slash on the line that best represented the amount of risk they were willing to take with regard to the risky supplier's bid. It was thought that the lack of numbers on

would prevent subjects from recalling their previous responses. Upon completing the case development tasks and responding to the choice and risk preference questions, subjects were exposed to the influence manipulations.

After reading the influence manipulations, subjects were instructed to return to the laboratory conference room and await further instructions. Upon arriving in the conference room, subjects assembled as a group around the rectangular conference table, one on each side. Next, the group received two questionnaires, one for the first procurement scenario and one for the second procurement scenario. These questionnaires were identical to those which they responded to as individuals. They were then instructed that they were to respond as a group to the two questionnaires.

The questionnaires appeared stapled, in the same order in which they appeared previously, in the center of the table with a pencil. The experimenter told subjects that they were to respond to each questionnaire with one group response, and that their group discussions to arrive at their consensus opinions would be video-recorded using one of the cameras on the laboratory wall. The same camera was used to record each group's discussion.

Finally, after responding as a group to the questionnaires, the experimenter ushered the subjects back to the individual rooms in the laboratory where they completed a

third questionnaire. This final questionnaire asked subjects descriptive information about themselves, including their age, gender, and academic level. After subjects completed the final questionnaire, they were debriefed and dismissed. Groups completed their tasks in about one-hour.

Method of Analysis

The final experiment was a partially confounded factorial analysis of variance. In order to have had a completely crossed design, experimental realism would have been sacrificed. Recall that each subject reviewed two procurement scenarios. One scenario contained a gain frame manipulation, and the other a loss frame manipulation. In order to have a completely crossed design, some subjects would have to have been exposed to two gain frame conditions, and others to two loss frame conditions. In these cases, the two procurement budgets and supplier's bids would have been exactly the same for each scenario, which would seem unrealistic.

In addition, each scenario contained an attribution for uncertainty regarding the risky supplier's bid. One scenario contained a financial attribution for the risky supplier's uncertain bid, and the other scenario contained a performance attribution for the risky supplier's uncertain bid. Again, in order to have a completely crossed design some subjects would have to have been exposed to two scenar-

ios containing only the financial attribution for uncertainty. Other subjects would have to have been exposed to two scenarios containing only the performance attribution for uncertainty. Once again, this would make the procurement scenarios seem contrived. Therefore, to achieve some degree of experimental realism, a partially confounded experimental design was employed.

Since some of the interactions were confounded with groups, only partial information was available to examine some of the effects. Table 4-6 shows the information available from the experiments. Both experimental plan 1 and plan 2 were employed in the experiments.

Table 4-6
Information on Various Experimental Effects

Effect	Plan 1	Plan 2
Scenario	Full Information	Full Information
Frame	Full Information	Full Information
Attribution	Full Information	Half Information
Scenario*Frame	No Information	No Information
Scenario*Attribution	No Information	Half Information
Frame*Attribution	No Information	Half Information
Scen*Fram*Attrib	Full Information	Half Information

Other experimental plans were available that would provide different levels of information for each effect. However, the present plans were chosen to maximize the amount of information available for the hypothesized effects. Complete information for all effects could have been obtained by dramatically increasing the sample size and decreasing the realism of the experiment.

Since no higher order effects (i.e., three way interactions) were hypothesized, they were eliminated from consideration during the analysis. This had the effect of pooling the three way interaction variance with either the specified effects or the error variance. Also, the degrees of freedom associated with this three way interaction were pooled with the error degrees of freedom. This decision was adhered to throughout the analysis and was made prior to conducting any

analyses.

The analysis was conducted using the SAS (Statistical Analysis Software) version 6.1 general linear models (GLM) procedure. This analytical procedure resulted in the partitioning of total variance into various components. Some of effects were unconfounded, and some were confounded effects. For the unconfounded effects for which there were no hypotheses, the GLM procedure yielded an accurate p-value (i.e., a two-sided test). For unconfounded effects for which there were directional hypotheses, the GLM procedure yielded a p-value twice as large as it should be (i.e., GLM provided a two-sided p-value but the tests were one-sided). Therefore, the p-value generated by SAS to test these hypotheses was divided in half manually.

The confounded effects were those effects for which there was only half information. In these cases, the F statistic computed by the GLM procedure was incorrect (i.e., the program assumed full information). To correct this problem, the F statistic was hand calculated using two-times the mean square error to correct for the one-half sample size employed in these tests. P-values for these F statistics were computed using the cumulative distribution function provided by the Minitab Statistical Software program, release 6.1. Again, the p-values for the effects for which there were no directional hypotheses were correct, and

directional hypotheses were tested using one-half the p-value. All reported p-values herein are the corrected p-values and are the values used to test the hypotheses. Hypotheses are assessed at a .10 significance level. However, all corrected p-values are reported for the readers convenience in interpretation.

The following chapter will present the results of the analyses with respect to the hypotheses advanced in the Conceptual Development chapter.

Chapter 5

EXPERIMENTAL RESULTS

The results of the experiments are presented in the following order. First, the main effect of decision frame on choice and risk preferences are presented. They include: (1) The effect of decision frame on the choice of a supplier for goods procurements, (2) the effect of the decision frame on the choice of a supplier for service procurements, (3) the effect of the decision frame on the risk preferences for a supplier for goods procurements, and (4) the effect of the decision frame on the risk preferences for a supplier for service procurements.

Second, the *absolute* effects of decision frame and influence on choice shift and risk preference shift are examined. The absolute effects are those effects that differ significantly from zero. They include: (1) the effect of decision frame and influence type on choice shift for goods procurements, (2) the effect of decision frame and influence type on choice shift for service procurements, (3) the effect of decision frame and influence type on risk preferences for goods procurements, and (4) the effect of decision frame and influence type on risk preferences for service procurements.

Finally, the *relative* effects of decision frame and

influence are examined. The relative effects involve comparisons between the dependent variables themselves (as opposed to comparing the dependent variable to zero). They include: (1) the effect of decision frame and influence type on choice shift for goods procurements, (2) the effect of decision frame and influence type on choice shift for service procurements, (3) the effect of decision frame and influence type on risk preferences for goods procurements, and (4) the effect of decision frame and influence type on risk preferences for service procurements.

Effect of Decision Frame on Choice

Goods Procurement Scenarios

Hypothesis 1a proposed that the way in which a procurement decision is framed (i.e., whether the supplier's bids are above or below the buyer's procurement budget) would have an effect on a buyer's choice of a supplier. Specifically, that gain frames would lead to relatively more cautious supplier choices and loss frames lead to relatively more risky supplier choices.

Since some of the operational independent variable effects (i.e, scenario type and attribution for uncertainty) were partially confounded with groups, a new dependent variable was created for the analysis of variance. This decision was made before any analyses were conducted. The dependent variable used in the analysis of variance examin-

ing the effect of decision frame on choice of supplier and risk preferences for a supplier was the average response of the individuals in each group prior to the group interaction.

Table 5-1 shows the analysis of variance results for the effect of decision frame on choice of a supplier for the goods procurement scenarios.

Table 5-1
Analysis of Variance
Choice of Supplier - Goods
Time 1

Source	DF	SS	MS	F	P
Frame	1	0.0175781	0.0175781	1.08	0.1609
Scenario	1	0.0488281	0.0488281	2.99	0.1118
Attribution	1	0.0625000	0.0625000	1.913	0.1941
Scen*Attrib	1	0.0976562	0.0976562	2.99	0.1117
Fram*Attrib	1	0.0625000	0.0625000	1.913	0.1941
Error	11	0.1796875	0.0163352		
Total	31	0.9921875			

For the goods procurement scenarios, the effect of decision frame on the choice of a supplier was not significant ($F = 1.08$, $P = 0.1609$). Therefore, hypothesis 1a is rejected for the goods procurement scenarios. Table 5-2 shows the means and standard deviations for the goods procurement scenarios. The range on the dependent variable was

cautious choice (1) or risky choice (2)[2]. Examination of the means shows that subjects in the loss frame condition made a relatively more cautious supplier choice than those in the gain frame condition. This difference was not significant.

Table 5-2
Means and Standard Deviations
Choice of Supplier - Goods
Time 1

		Loss Frame	Gain Frame
Financial Attribution			
	Audio Visual	1.40625 (.5124)	1.375 (.5081)
	Musical Instrument	1.59375 (.5124)	1.5625 (.5260)
Performance Attribution			
	Audio Visual	1.28125 (.3787)	1.34375 (.4629)
	Musical Instrument	1.1875 (.4083)	1.375 (.4987)
Grand Mean		1.3671875	1.4140625

Service Procurement Scenarios

Table 5-3 shows the analysis of variance for the effect of decision frame on the choice of supplier for the service

[2]Winer, Brown, andd Michels (1991) note that the F statistic computed by treating dichotomous data as if the measurements were normally distributed yields probability ststements that are relatively close.

procurement scenarios. For the service procurement scenarios, the effect of decision frame on the choice of a supplier was significant (F = 9.35, P = 0.0055).

In order to see whether hypothesis 1a is supported for services, the means must be examined. Table 5-4 shows the

Table 5-3
Analysis of Variance
Choice of Supplier - Services
Time 1

Source	DF	SS	MS	F	P
Frame	1	0.2812500	0.2812500	9.35	0.0055
Scenario	1	0.4394531	0.4394531	14.60	0.0028
Attribution	1	0.1650391	0.1650391	2.74	0.1261
Scen*Attrib	1	0.0478516	0.0478516	0.795	0.3917
Fram*Attrib	1	0.0478516	0.0478516	0.795	0.3917
Error	11	0.3310547	0.0300959		
Total	31	1.5625000			

means and standard deviations for the service procurement scenarios.

As can be seen from Table 5-4, the mean choice of supplier for the loss frame condition is lower than the mean choice of supplier for the gain frame condition. This means that subjects in the loss frame chose relatively more cautious suppliers than those in the gain frame condition. Therefore, hypothesis 1a is rejected for the service procurement scenarios.

Table 5-4
Means and Standard Deviations
Choice of Supplier - Services
Time 1

		Loss Frame	Gain Frame
Financial Attribution			
	Collection Agency	1.3125 (.4902)	1.40625 (.4945)
	Printing Company	1.53125 (.5039)	1.71875 (.4629)
Performance Attribution			
	Collection Agency	1.15625 (.3199)	1.40625 (.3881)
	Printing Company	1.375 (.4765)	1.59375 (.5218)
Grand Mean		1.34375	1.53125

Effect of Decision Frame on Risk Preferences

Goods Procurement Scenarios

Hypothesis 1b proposed that a buyer's risk preferences for a supplier will change depending on the way the procurement decision is framed. Specifically, gain frames lead to relatively more risk averse preferences for suppliers and loss frames lead to relatively more risk seeking preferences for suppliers. The range on this dependent variable was 0-100%.

Table 5-5 shows the analysis of variance for the effect

of decision frame on risk preferences for a supplier for the goods procurement scenarios. For the good procurement scenarios, the effect of decision frame on the risk preferences for a supplier was significant ($F = 2.48$, $P = 0.0719$).

Table 5-5
Analysis of Variance
Risk Preferences for Supplier - Goods
Time 1

Source	DF	SS	MS	F	P
Frame	1	77.37680	77.37680	2.48	0.0719
Scenario	1	35.09125	35.09125	1.12	0.3118
Attribution	1	56.23125	56.23125	0.90	0.3632
Scen*Attrib	1	3.28969	3.28969	0.055	0.8189
Fram*Attrib	1	10.96438	10.96438	0.175	0.6838
Error	11	343.39478	31.21771		
Total	31	1140.87060			

An examination of the mean risk preferences between the two frames (Table 5-6) shows that subjects in the loss frame were relatively more risk averse than those in the gain frame. That is, subjects in the loss frame said that they would have to be more certain of the risky supplier's low bid price before contracting with them than subjects in the gain frame. Therefore, hypothesis 1b is rejected for goods procurements.

Table 5-6
Means and Standard Deviations
Risk Preferences for Supplier - Goods
Time 1

		Loss Frame	Gain Frame
Financial Attribution			
	Audio Visual	73.6575 (20.73)	70.71875 (17.99)
	Musical Instrument	67.6875 (16.72)	70.78 (17.70)
Performance Attribution			
	Audio Visual	78.40625 (15.07)	73.625 (17.29)
	Musical Instrument	78.6875 (13.08)	70.875 (20.01)
Grand Mean		74.539375	71.499687

Service Procurement Scenarios

Table 5-7 shows the analysis of variance for the effect of decision frame on the risk preference for a supplier for the service procurement scenarios. For services, no significant effect of decision frame on the risk preferences for a supplier was found. Again, hypothesis 1b is rejected for service procurements. Table 5-8 shows the mean risk preferences for subjects in the service procurement conditions.

In summary, all hypothesized effects were in the opposite direction. For the goods procurement scenarios, the effect of decision frame on choice was not significant but

Table 5-7
Analysis of Variance
Risk Preferences for Supplier - Services
Time 1

Source	DF	SS	MS	F	P
Frame	1	90.8215	90.8215	0.60	0.2277
Scenario	1	30.6936	30.6936	0.20	0.6616
Attribution	1	2.3447	2.3347	0.01	0.9221
Scen*Attrib	1	422.4566	422.4566	1.395	0.2625
Fram*Attrib	1	98.5801	98.5801	0.325	0.5801
Error	11	1668.3900	151.6718		
Total	31	4477.4985			

the effect of decision frame on risk preferences was significant. The opposite results were found for the service procurement scenarios. For the service procurement scenarios, the effect of decision frame on choice was significant, but the effect of decision frame on risk preferences was not significant.

Since these results are so contradictory, a McNemar Test for Significant Change for nominal data and dependent samples was performed at the individual level to see if there was an equal number of choice changes toward the cautious or risky supplier given a fixed change in decision frame (Hinkle, Wiersma, and Jurs 1979). The null hypothesis that was tested was that there was an equal number of sub-

Table 5-8
Means and Standard Deviations
Risk Preferences for Supplier - Services
Time 1

		Loss Frame	Gain Frame
Financial Attribution			
	Collection Agency	77.3125 (16.19)	75.9375 (16.74)
	Printing Company	77.21875 (13.03)	70.34375 (18.85)
Performance Attribution			
	Collection Agency	80.54 (12.12)	72.46875 (16.61)
	Printing Company	81.84375 (9.68)	69.4375 (19.67)
Grand Mean		79.22856	72.046875

jects that shifted toward the cautious supplier as shifted toward the risky supplier. The data presented in Table 5-9 is for subjects who reviewed the good procurement scenarios only. Also, these subjects were presented with a gain frame first and a loss frame second. In Table 5-9, cell A represents the frequency of subjects that were exposed to the gain frame first and chose the cautious supplier, then were exposed to the loss frame and chose the risky supplier. Similarly, cell B shows the frequency of subjects that were exposed to the gain frame first but chose the risky supplier, and were next exposed to the loss frame and chose the

risky supplier again. Cell C shows the frequency of subjects that were exposed to the gain frame first and chose the cautious supplier, and were next exposed to the loss frame and chose the cautious supplier again. Finally, cell D shows the frequency of subjects that were initially exposed to the gain frame and chose the risky supplier, then were exposed to the loss frame and chose the cautious supplier.

As can be seen in Table 5-9, a large number of subjects (i.e., 33%) shifted from the cautious supplier under the gain frame toward the risky supplier under the loss frame. This number was significant ($X^2 = 3.9$, $df = 1$, $p < .10$).

Table 5-10 presents the results for those subjects reviewing the goods scenarios that were first exposed to a loss frame and next a gain frame.

As can be seen in Table 5-10, 45% of subjects first exposed to the loss frame chose the cautious supplier, then when exposed to the gain frame chose the risky supplier. This shift was also significant ($X^2 = 7.0487$, $df = 1$, $p < .10$). These results are opposite those for the goods procurement scenario where the gain frame was presented first and the loss frame second.

Results for the service procurement scenario where the gain frame was presented first and the loss frame second are presented in Table 5-11.

Table 5-9
Frequencies of Subject's Choices -
Goods Procurement Scenarios,
Gain Frame First and Loss Frame Second

		Gain Frame - Time 1		
Loss Frame - Time 2		Cautious Choice	Risky Choice	Row Total
	Risky Choice	**A** 21	**B** 7	28
	Cautious Choice	**C** 26	**D** 10	36
	Column Total	47	17	64

The results indicate that 39% of subjects who were first exposed to the gain frame chose the risky alternative, and then switched to the cautious supplier when exposed to the loss frame. This result was also significant ($X^2 = 6.428$, $df = 1$, $p < .10$) and opposite to the results of the goods procurement scenarios with a similar order of frame presentation and similar to the goods procurement scenario with the opposite order of presentation.

Finally, Table 5-12 shows the results for the service scenario when the loss frame was presented first and the gain frame second. Here, 36% of subjects first exposed to the loss frame chose the cautious supplier, then chose the

Table 5-10
Frequencies of Subject's Choices -
Goods Procurement Scenarios,
Loss Frame First and Gain Frame Second

	Loss Frame - Time 1			
Gain Frame - Time 2		Cautious Choice	Risky Choice	Row Total
	Risky Choice	29	7	36
	Cautious Choice	16	12	28
	Column Total	45	19	64

risky supplier when exposed to a gain frame. Although these results are similar to those presented for the goods scenario/loss frame first and service scenario/ gain frame first, they are not significant ($X^2 = 2.189$, $df = 1$, $p > .10$).

In summary, three of the four decision frame permutations suggest that under a loss frame subjects were more likely to choose the cautious supplier, and under a gain frame a risky supplier. However, this result is tempered by the fact that one of the results was not statistically significant and the other was significant in the hypothesized direction (i.e., opposite the others). The next section will discuss the results with respect to the effect of

Table 5-11
Frequencies of Subject's Choices - Service Procurement Scenarios, Gain Frame First and Loss Frame Second

	Gain Frame - Time 1			
Loss Frame - Time 2		Cautious Choice	Risky Choice	Row Total
	Risky Choice	10	7	17
	Cautious Choice	22	25	47
	Column Total	32	32	64

normative and informational influence on choice and risk preference shift. However, before the results are presented a check on the influence manipulation was conducted.

Influence Manipulation Check

Prior to conducting the analyses, a check was made on the influence manipulation. Two independent coders, blind to the experimental hypotheses, reviewed the video-taped group discussions and coded the discussions. The content-coding scheme for evaluating the group discussion was adopted from previous studies comparing face-to-face communication in groups (see, for example, Weisband 1992). In the

Table 5-12
Frequencies of Subject's Choices -
Service Procurement Scenarios,
Loss Frame First and Gain Frame Second

	Loss Frame - Time 1			
Gain Frame - Time 2		Cautious Choice	Risky Choice	Row Total
	Risky Choice	23	13	36
	Cautious Choice	14	14	28
	Column Total	37	27	64

coding scheme, the main unit of analysis was each separable thought or remark each group member uttered during the group discussion. The two coders independently coded subjects' remarks and counted them. The coders classified the remarks into one of the categories shown in Table 5-13.

For purposes of this study, informational influence was operationalized as arguments, and normative influence was operationalized as implicit decision preferences and explicit decision proposals. In order to determine the degree to which the independent coders agreed in their coding of the group discussions, the inter-rater reliability correlation coefficient was computed. For informational influence the

correlation coefficient was highly significant and positive ($r = .91$, $p < .01$). For normative influence the correlation coefficient was slightly lower, but still highly significant and positive ($r = .75$, $p < .01$). Therefore, it seemed reasonable to assume that the data generated from the independent coders was reliable enough to use as input for further analyses.

Table 5-13
Content Coding Scheme*

Arguments: Remarks citing facts provided in or inferred from the task description. (e.g., "The budget is $350,000.")
Implicit Decision Preferences: Remarks alluding to one's preference for risk or caution. (e.g., "I think we should be conservative in our choice.")
Explicit Decision Proposals: Remarks advocating one of the decision alternatives. ("I think we should choose the risky supplier.")
Social Pressure: Remarks applying, or responding to, pressure on actions and decisions. (e.g., "Lets finish, I've got an exam tomorrow." or "I guess I'll give in to you guys.")
Process: Remarks about rules and procedures. (e.g., "What should we put down for this one?")
Task Irrelevant: Remarks irrelevant to the problem (but not irrelevant to the situation). (e.g., "I could go for a beer about now.")
Uninhibited Remarks: Remarks containing swear words, name-calling, or insults. (e.g., "Don't be a jerk!" or "That's a stupid argument.")
*Source: Weisband (1992)

In order to check the influence manipulation, we compared the differences in the proportion of normative statements between the informational influence condition and the

normative influence condition as well as the proportion of informational statements between the informational influence condition and the normative influence condition. In order to support the manipulation, the proportion of informational influence statements should be significantly greater in the informational influence condition than in the normative influence condition. Similarly, the proportion of normative influence statements should be significantly greater in the normative influence condition than in the informational influence condition.

The average of the two independent coder's data was used in the analysis. One analytical procedure that can be used to test for the differences in these proportions is the test for differences in proportions for independent samples (Hinkle, Wiersma, and Jurs 1979)[3]. This test is appropriate

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[3]Hinkle, Wiersma, and Jurs (1979) present the test for differences in proportions for independent samples. This is a z-test where:

$$z = \frac{p_1 + p_2}{s_{p_1} - s_{p_2}}$$

and:
- p_1 = the proportion (of either informational or normative statements) in the first sample.
- p_2 = the proportion (of either informational or normative statements) in the second sample.
- $s_{p1} - s_{p2}$ = the standard error of the difference between independent proportions and is estimated by:

$$s_{p_1} - s_{p_2} = \sqrt{pq\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}$$

and: $p = (f_1 + f_2)/(n_1 + n_2)$

since the influence treatment was a between groups factor.

Table 5-14 shows the data that provided input into the analyses. As can be seen in Table 5-14, the proportion of normative and informational influence was approximately the same for both types of influence. In the normative condition, the proportion of normative statements was .2872. In the informational influence condition the proportion of normative statements was .3035. That is, there was a higher proportion of normative statements in the group discussions in the informational influence condition than in the normative condition. This difference was not significant and in the wrong direction ($z = -1.017$, $p = .3124$).

The proportion of informational statements in the normative condition was .5545 compared to the proportion of informational statements in the informational influence condition of .5596. There was a higher proportion of informational statements in the group discussions in the informational influence condition than in the normative condition. However, this difference was not significant ($z =$

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where:

f_1 = frequency of occurrence in the first sample.

f_2 = frequency of occurrence in the second sample.

and: $q = 1 - p$.

0.291, p = .7718). It is clear from these results that the influence manipulations failed. Therefore, hypothesis tests

Table 5-14
Frequency of Informational, Normative, and Total Statements for the Normative and Informational Influence Conditions.

	Frequency of Normative Statements	Frequency of Informational Statements	Total Number of Statements
Normative Influence Condition	492 (.2872)*	950 (.5545)	1713
Informational Influence Condition	468 (.3035)	863 (.5596)	1542
Total	960	1813	

*Numbers in parentheses are proportions.

based on these manipulations are compromised.

In order to examine the hypotheses, groups were arbitrarily divided based on the mean number of normative and informational statements generated for all groups. For all groups, the mean number of informational statements was 14.1625 (per group) and the mean number of normative statements was 7.495 (per group). Two sets of groups were formed based on these means: one set of groups that generated lower than average informational statements and higher than average normative statements; and another set of groups that

generated higher than average informational statements and lower than average normative statements during group discussion. These sets of groups were called the low informational/high normative groups and the high informational/low normative groups respectively. These two sets of groups were used to examine the hypotheses regarding normative and informational group influence.

At least two caveats should be kept in mind with respect to the use of these groups in the hypothesis tests. First, these groups are no longer defined on an a priori basis. As such, it may be better to view the analyses that follow as post hoc analyses. Second, since the groups were no longer manipulated, it is probably more correct to view them as measured groups. Therefore, any claims for causality regarding the effect of the two types of influence may no longer be applied. Any relationships between influence, decision frame and choice or risk preferences that may be uncovered are strictly correlational in nature.

The *Absolute* Relationship between Decision Frame, Influence, and Choice Shift

Generally, hypotheses 2a and 2b, 3a and 3b, 4a and 4b, and 5a and 5b state that decision frame and influence type have a combined effect on a buying center's choice shift (i.e., the average choice of the buying group before group discussion compared with the buying group's choice after

group discussion) and risk preference for a supplier. In order to examine the effects of decision frame and influence on a buying center's choice and risk preference compared with those of the individual group members prior to buying center interaction, two new dependent variables were created prior to any analyses.

The first dependent variable was a difference variable representing the average group member choice before the group discussion minus the group choice after the group discussion. The choice shift dependent variable represents the difference between the average choice of the individual group members prior to group discussion and the buying center's choice after group discussion. A positive choice shift number indicates that the prior choice is of higher magnitude than the latter choice, since the subject's choice was coded as (1) cautious supplier and (2) risky supplier. This represents a cautious shift or a shift toward the cautious supplier after group interaction. A negative choice shift number indicates that the prior choice is of a lower magnitude than the latter choice. This represents a risky shift or a shift toward the risky supplier after group discussion.

The second dependent variable was also a difference variable representing the average group member risk preference before the group discussion minus the group risk pref-

erence after the group discussion. The risk preference shift dependent variable represents the difference between the average risk preference of the individual group members prior to group discussion and the buying center's risk preference after group discussion. A positive risk preference shift number indicates the opposite. This is due to the coding scheme where 0% on the scale represented complete uncertainty and 100% represented complete certainty. Therefore, a positive shift number for risk preference implies that the prior risk preference is of a higher magnitude than the later. This indicates a shift toward risk seeking. A negative risk shift number implies that the prior risk preference was lower in magnitude than the later, indicating a risk averse shift.

All analyses were conducted on these two newly created dependent variables and can be thought of as an *absolute* choice shifts and risk preference shifts (i.e., as compared to zero shift).

Hypothesis 2a proposed that a gain frame and normative influence would cause a buying center's choice of a supplier to shift toward more extreme caution. The means and standard deviations for a buying centers' choice shift and risk preference shift and normative influence for a supplier across good and service procurements are shown in Table 5-15.

In order for hypothesis 2a to be supported, two conditions must hold. First, the mean choice shift must be in the hypothesized direction. Second, the mean choice shift

Table 5-15
The Effect of Normative Influence on Choice and Risk Preference

	Mean Choice Difference	Mean Risk Preference Difference
Gain Frame	-0.0833 (.515)	4.4167 (12.501)
Loss Frame	-0.1000 (.496)	-2.075 (17.114)

Numbers in parentheses are standard deviations.

must be significantly different from zero. As can be seen from Table 5-15, the mean choice shift (-0.0833) was opposite that hypothesized (i.e., toward more risk). Second, the mean choice shift was not significantly different from zero ($t = -0.56$, $df = 11$ $p > .10$) as assessed using the dependent t-test. Therefore, hypothesis 2a is rejected.

Hypothesis 2b proposed that a gain frame and normative influence would cause a buying center's preferences for risk to become more risk averse. Again, results indicate that their risk preferences became more risk seeking, although this shift was not statistically significant ($t = 1.22$, $df = 11$, $p > .10$).

Hypothesis 3a proposed that a loss frame and normative influence would cause a buying center's choice to shift toward more extreme risk. Table 5-15 shows that their choices did shift toward more risk, however this shift was not statistically significant ($t = 1.27$, $df = 39$, $p > .10$).

Finally, hypothesis 3b proposed that a loss frame and normative influence would cause a buying center's risk preferences to become more risk seeking. The results indicate the opposite. The preference shift was toward risk aversion, although this shift was not significant ($t = -0.77$, $df = 39$, $p > .10$).

In conclusion, results of this study suggest that normative influence does not play a major role in inducing a choice shift among buying center participants. However, the power to detect these shifts was greatly decreased as a result of the failed manipulation.

Hypothesis 4a proposed that a gain frame and informational influence would cause a buying center's choice of a supplier to shift toward more extreme caution. The means and standard deviations for a buying centers' choice shift and risk preference shift and informational influence for a supplier across goods and service procurements are shown in Table 5-16.

As can be seen from Table 5-16, the mean choice shift (-0.0500) was opposite that hypothesized (i.e., toward more

risk). Second, the mean choice shift was not significantly different from zero ($t = -0.37$, $df = 20$ $p > .10$). Therefore, hypothesis 4a is rejected.

Hypothesis 4b proposed that a gain frame and informational influence would cause a buying center's preferences for risk to become more risk averse. Again, results indicate that their risk preferences became more risk seeking, although this shift was not statistically significant ($t = 1.18$, $df = 19$, $p > .10$).

Table 5-16
The Effect of Informational Influence on Choice and Risk Preference

	Mean Choice Difference	Mean Risk Preference Difference
Gain Frame	-0.0500 (.605)	7.000 (26.477)
Loss Frame	-0.5000 (.535)	-3.875 (15.310)

Numbers in parentheses are standard deviations.

Hypothesis 5a proposed that a loss frame and informational influence would cause a buying center's choice to shift toward more extreme risk. Table 5-16 shows that their choices did shift toward more risk, and this shift was also statistically significant ($t = -2.65$, $df = 7$, $p < .10$).

Finally, hypothesis 5b proposed that a loss frame and

informational influence would cause a buying center's risk preferences to become more risk seeking. The results indicate the opposite. The preference shift was toward risk aversion, although this shift was not significant ($t = -0.72$, $df = 7$, $p > .10$).

In conclusion, these results do not provide strong support for the effect of informational influence in inducing a choice shift among buying center participants. Once again, the power to detect these shifts was greatly decreased as a result of the failed manipulation.

The next section provides the results of the analysis conducted to explore the effect of the relative differences in impact of normative and informational influence between goods and services. These effects can be characterized as the *relative* effects (i.e., comparing effects to each other) of decision frame and influence on choice shifts for a supplier.

The *Relative* Relationship Between Decision Frame, Influence, Choice Shift, and Risk Preference

Hypothesis 6a proposed that a gain frame and informational influence will cause a buying center's choice of a supplier to shift more toward caution than a gain frame and normative influence goods procurements. Hypothesis 6b proposed that a gain frame and informational influence will

cause a buying center's risk preferences for a supplier to become more risk averse than a gain frame and normative influence for the procurement of goods. Unfortunately, the partitioning of groups based on the mean number of informational and normative statements generated during group discussion resulted in no data for the gain frame, informational influence condition for goods procurements. Therefore, these hypotheses are left untested.

Hypothesis 6c proposed that a loss frame and informational influence will cause a buying center's choice of a supplier to shift more toward risk than a loss frame and normative influence for the procurement of goods. Table 5-17 contains the choice-shift data relating to informational and normative influence for the goods procurement scenarios under the loss frame.

Table 5-17
Choice Shifts for Informational and Normative Influence - Loss Frame, Goods Procurement Scenarios

	Informational Influence	Normative Influence
Mean Choice Difference	-.50	.19
Standard Deviation	.58	.40
Sample Size	4	16

n = number of individuals

The two sample t-test with unequal variances was used to test these hypotheses since the sample sizes between the two groups are unequal (Hinkle, Wiersma, and Jurs 1979). With this test, the standard error of the difference is estimated differently, and the degrees of freedom used to test the hypothesis are adjusted[4]. Based on this test, a loss frame and informational influence resulted in a greater shift toward the risky supplier than a loss frame and normative influence ($t = -2.249$, $df = 5$, $p < .10$). Therefore, hypothesis 6c is supported.

Hypothesis 6d proposed that a loss frame and informational influence will cause a buying center's risk preferences for a supplier to become more risk seeking than a loss frame and normative influence for the procurement of goods. Table 5-18 provides the information used to test this hypothesis.

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[4]Hinkle, Wiersma, and Jurs (1979) provide the formulas for making these adjustments. The standard error of the difference is computed as:

$$s = \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}$$

and the degrees of freedom are adjusted by:

$$df = \frac{(\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2})^2}{\frac{(s_1^2)^2}{(n_1 + 1)} + \frac{(s_2^2)^2}{(n_2 + 1)}} - 2$$

As can be seen in Table 5-18, both risk preference shifts were toward risk aversion rather than risk seeking. Furthermore, the shift associated with informational influence exceeded the shift associated with normative influence. Finally, this shift difference was not significant

Table 5-18
Risk Preference Shifts for Informational and Normative Influence - Loss Frame, Goods Procurement Scenarios

	Informational Influence	Normative Influence
Mean Choice Difference	-11.25	-7.37
Standard Deviation	15.71	12.18
Sample Size	4	16

n = number of individuals

($t = -0.46$, $df = 5$, $p > .10$). Therefore, hypothesis 6d is rejected.

Hypothesis 7a proposed that a gain frame and normative influence will cause a buying center's choice of a supplier to shift more toward caution than a gain frame and informational influence for the procurement of services. Table 5-19 provides the data that were used to test this hypothesis under the gain frame.

Table 5-19 shows that under the gain frame, both infor-

mational and normative influence resulted in a risky choice shift rather than a cautious choice shift. Furthermore, the magnitude of this risky choice shift was greater for normative versus informational influence. Finally, this magnitude was significant ($t = -1.41$, $df = 10$, $p < .10$). Therefore, hypothesis 7a is rejected.

Table 5-19
Choice Shifts for Informational and Normative Influence - Gain Frame, Service Procurement Scenarios

	Informational Influence	Normative Influence
Mean Choice Difference	-.05	-.50
Standard Deviation	.60	.58
Sample Size	20	4

n = number of subjects

Hypothesis 7b proposed that a gain frame and normative influence will cause a buying center's risk preferences for a supplier to become more risk averse than a gain frame and informational influence for the procurement of services. Table 5-20 provides the data that were used to test this hypothesis.

Table 5-20
Risk Preference Shifts for Informational and Normative Influence - Gain Frame, Service Procurement Scenarios

	Informational Influence	Normative Influence
Mean Choice Difference	7.0	4.50
Standard Deviation	26.48	14.36
Sample Size	20	4

n = number of individuals

As can be seen in Table 5-20, the risk preference shifts for both normative and informational influence were toward risk seeking rather than toward risk aversion. Furthermore, the shift attributable to informational influence was greater than that for normative influence. Finally, the difference in magnitude between these risk preference shifts was not significant ($t = -0.2686$, $df = 11$, $p > .10$). Therefore, hypothesis 7b is rejected.

Hypothesis 7c proposed that a loss frame and normative influence will cause a buying center's choice of a supplier to shift more toward risk than a loss frame and informational influence for the procurement of services. Table 5-21 provides the data that were used to test this hypothesis under the loss frame.

Table 5-21
Choice Shifts for Informational and Normative Influence - Loss Frame, Service Procurement Scenarios

	Informational Influence	Normative Influence
Mean Choice Difference	-.50	.04
Standard Deviation	.58	.55
Sample Size	4	24

n = number of individuals

Table 5-21 shows that informational influence resulted in a risky choice shift and normative influence resulted in a cautious choice shift. The magnitude of the difference between these two choice shifts was significant ($t = 1.74$, $df = 5$, $p < .10$). Therefore, hypothesis 7c is rejected.

Finally, hypothesis 7d proposed that a loss frame and normative influence will cause a buying center's risk preferences for a supplier to become more risk seeking than a loss frame and informational influence for the procurement of services. Table 5-22 shows the data that were used to test this hypothesis.

As Table 5-22 indicates, both normative and informational influence resulted in a risk seeking shift. However, the magnitude of the shift was greater for informational influence than for normative influence. Finally, the dif-

ference between the two was not significant ($t = -0.278$, $df = 8$, $p > .10$). Therefore, hypothesis 7d is rejected.

Table 5-22
Risk Preference Shifts for Informational and Normative Influence - Loss Frame, Service Procurement Scenarios

	Informational Influence	Normative Influence
Mean Choice Difference	3.50	1.46
Standard Deviation	12.45	19.17
Sample Size	4	24

n = number of individuals

This concludes the section on data analysis and results. The next chapter discusses the results and concludes the research.

Chapter Six

DISCUSSION AND CONCLUSION

The major thesis advanced in this research was that buying center discussion will reinforce the gain and loss implications predicted by prospect theory. That is, buying center members preferences for a risky or cautious supplier would become more extreme in the same direction as a result of buying center interaction. The questions raised by this thesis are: (1) Do buying center member's preferences become more risk averse as a result of group interaction for procurement decisions framed as gains? (2) Do buying center member's preferences become more risk seeking as a result of group interaction for procurement decisions framed as losses? and (3) Is there a difference in the reactions of buyers to a decision frame and group influence resulting from the procurement being goods-based versus service-based?

The conceptual model offered in chapter three proposes some answers to these questions. This model, in conjunction with the results of the experiments conducted on it, are discussed below. In addition, the implications of this research from a conceptual, methodological and substantive viewpoint will be discussed. The discussion will begin with an overview of the experimental findings.

Summary of the Findings

Table 6-1 summarizes the findings from the experiment. A cursory overview of the results presented in this Table reveals that (1) almost all of the results were opposite the direction hypothesized, and (2) most of the results were not significant. This section will attempt to explain the reasons for these results. The section will begin by discussing a possible explanation for the opposite results and end by discussing the probable explanation for the nonsignificant results.

The Complexity of Organizational Buying. Organizational buying is a complex process involving a number of people, each playing different roles in the purchase, and these people vary from one purchase situation to the next. This is primarily due to the nature of the buying task organizations face. Organizational procurements tend to be technologically complex, require a relatively long evaluation time, involve a large amount of uncertainty, and money. As a result, organizational purchases require a large amount of factual information as well as the opinions of others in the organization. As Sherlok (1992) proposed, business buying decisions are not simply logical, rational acts. Social and personal factors also influence the purchase decision.

This research differs from other research on organizational buying in that it attempted to account for the ef-

fects of factual and social factors on procurement choice and preferences. The effect of decision frame on choice and risk preference was intended to capture the effect of objective facts on organizational purchase decision making. The effect of normative and informational influence was intended to explore the effect of social factors on organizational buying decisions.

Kahneman and Tversky (1979) operationalized their decision frames as an individual choice between (1) a certain alternative, and (2) a risky alternative with the same expected value. For example, a typical operationalization of the gain decision frame might be: "Which of the following would you prefer?" to which the subject could choose either: (A) 50% chance to win $1,000, 50% chance to win nothing, or (B) $500 for sure. Two aspects should be noted with respect to this operationalization. First, the expected value of the risky alternative equals the expected value of the certain alternative. Second, these operationalizations asked respondents to imagine that they were actually faced with the choice described in the problem.

The present research differed in the operationalization of the decision frame. Here, a gain decision frame was operationalized as a choice between two supplier's bids, (A) certain bid below the budget, and (B) a risky supplier's bid below the budget with the same expected value.

Similarly, a typical operationalization of Kahneman and Tversky's (1979) loss frame might be: "Which would you prefer?" to which subjects could choose either; (A) 50% chance to lose $1000, 50% chance to loose nothing, or (B) loose $500 for sure. The present research operationalized the loss frame as a choice between two suppliers' bids, (A) certain bid above the budget or, (B) a risky supplier's bid above the budget with the same expected value.

One of the major differences between Kahneman and Tversky's (1979) operations and those of the present research is the personal relevance of the decisions. Subjects may have felt that the decisions they faced in the Kahneman and Tversky (1979) operation were personally relevant, while those in the present research were not personally relevant. Therefore, the lack of personal relevance in the present operationalization of the decision frame may have contributed to the opposite results for the effect of decision frame observed in this research.

The following section will attempt to explain the reason why subjects chose the risky supplier under the gain frame and the cautious supplier under the loss frame as operationalized in this research (i.e., opposite to the predictions offered by prospect theory).

Opposite Results. The conceptual model offered in Chapter Three proposed that a buyer's decision frame influenced the

choices and preferences of the buyer in a procurement situation. More specifically, that a buying decision framed as a gain would lead to a cautious choice and risk averse preferences and that a loss frame would lead to a risky choice and risk seeking preferences. The theoretical underpinning of this effect was based on the value function proposed by prospect theory (Kahneman and Tversky 1979). Prospect theory proposes that individuals evaluate objective choices with respect to a specific reference point in their minds. In choices between a certain alternative and a risky alternative, where both outcomes fall above this reference point, individuals are likely to frame the decision as a gain. In this case, individuals are likely to choose the certain

Table 6-1
Summary of the Experimental Findings

Hypothesis	Results
Gain frames lead to cautious supplier choices and loss frames lead to risky supplier choices.	No significant differences for goods. In the wrong direction for services.
Gain frames lead to risk averse preferences for suppliers and loss frames lead to risk seeking preferences for suppliers.	In the wrong direction for goods. No significant differences for services.
A gain frame and normative influence leads to a cautious supplier choice shift.	Not significant, wrong direction.
A gain frame and normative influence leads to risk averse preference shifts for a supplier.	Not significant, wrong direction.
A loss frame and normative influence leads to a risky supplier choice shift.	Not significant, right direction.
A loss frame and normative influence leads to risk seeking preference shifts for a supplier.	Not significant, wrong direction.
A gain frame and informational influence leads to a risky supplier choice shift.	Not significant, wrong direction.
A gain frame and informational influence leads to risk averse preference shifts for a supplier.	Not significant, wrong direction.

Table 6-1 (Continued)
Summary of the Experimental Findings

Hypothesis	Results
A loss frame and informational influence leads to a risky supplier choice shift.	Supported.
A loss frame and informational influence leads to risk seeking preference shifts for a supplier.	Not significant, wrong direction.
Supplier choices made under a gain frame and informational influence will be more cautious than under a gain frame and normative influence for goods.	Untested.
Supplier risk preferences made under a gain frame and informational influence will be more risk averse than under a gain frame and normative influence for goods.	Untested.
Supplier choices made under a loss frame and informational influence will be more risky than under a loss frame and normative influence for goods.	Supported.
Supplier risk preferences made under a loss frame and informational influence will be more risk seeking than under a loss frame and normative influence for goods.	Not significant, opposite direction.

Table 6-1 (Continued)
Summary of the Experimental Findings

Hypothesis	Results
Supplier choices made under a gain frame and normative influence will be more cautious than under a gain frame and informational influence for services.	In the wrong direction.
Supplier risk preferences made under a gain frame and normative influence will be more risk averse than under a loss frame and informational influence for services.	Not significant, opposite direction.
Supplier choices made under a loss frame and normative influence will be more risky than under a loss frame and informational influence for services.	In the wrong direction.
Supplier risk preferences made under a loss frame and normative influence will be more risk seeking than under a loss frame and informational influence for services.	Not significant, wrong direction.

alternative. The explanation has to do with the value function. In prospect theory, the value function represents the relationship between objective gains and losses and the subjective value that individuals place on these objective gains and losses. Individuals should choose the certain outcome when the decision is framed as a gain because the

increased subjective value associated with the further objective gain that could be obtained by choosing the risky alternative is less than the decreased subjective value associated with an objective loss of the same magnitude. Therefore, individuals will likely choose the certain alternative.

Conversely, when both choice alternatives fall below the individual's reference point, the decision is likely to be framed as a loss. In this case, the increased subjective value associated with a further objective gain that could be obtained by choosing the risky alternative is greater than the decreased subjective value associated with an objective loss of the same magnitude. Therefore, individuals will likely choose the risky alternative in an attempt to maximize the subjective value of the outcome.

There is, however, an alternative explanation for the effect of decision frame on an individual's choice. This explanation revolves around the perceived risk associated with the decision (Webster and Wind 1972, Sheth 1973). This explanation posits that buyers are motivated to reduce the perceived risk associated with a buying decision. As was previously discussed, the perceived risk felt by the buyer is posited to be a function of decision-related uncertainty and the magnitude of the aversive consequences associated with the decision. The nature that this function takes is

proposed to be multiplicative. This implies that a buying decision involving a low level of uncertainty will result in low perceived risk. Further, that decisions without aversive consequences will result in low perceived risk. In other words, for perceived risk to be felt, the buyer must have at least a moderate amount of decision-related uncertainty as well as feel that there is a moderate degree of aversive consequences associated with the decision outcome.

If a buyer is confronted with a purchase decision where perceived risk is felt, the buyer may be motivated to reduce it. Since buyers are motivated to reduce the perceived risk associated with the decision, buyers can either reduce decision-related uncertainty or reduce the aversive consequences associated with the decision. With actual organizational buying decisions it may be extremely difficult for a buyer to reduce the aversive consequences associated with a procurement. For example, postponing purchases such as component parts can have devastating effects on production scheduling.

Under most circumstances organizational buyers probably reduce their perceived risk by lowering decision-related uncertainty. This can be achieved in an organizational setting through either (1) internal information search of company records and collaboration with other company personnel, or (2) external information search. External buying

information can be obtained from several sources such as supplier's and their sales people, references, trade associations, etc.

However, in the present research, subjects were unable to reduce the uncertainty associated with the decision. In other words, uncertainty was constant across both gain and loss decision frames. Therefore, the focus is on the aversive consequences associated with the decision.

In the gain frame condition, the procurement budget was set so that both the certain supplier's bid and either outcome from the risky supplier would be below the procurement budget. In this case, subjects may have felt no perceived risk since there were essentially no aversive consequences associated with the procurement decision. Since subjects felt no risk in the decision, they may have simply chosen the risky supplier's bid in the hope that the more positive outcome from the risky supplier would materialize. In any case, it was a no lose situation for the subjects to choose the risky supplier.

In the case where the decision was framed as a loss, the procurement budget was set so that both the certain supplier's bid and either outcome from the risky supplier would be above the procurement budget. In this case, subjects may have felt a high level of perceived risk since any purchase choice that could be made would result in aversive

consequences. Since the aversive consequences associated with the decision could not be mitigated, and decision-related uncertainty could not be reduced to lower perceived risk, subjects may have chosen the cautious supplier simply because the aversive consequences associated with the bad outcome of the risky supplier would raise the perceived risk of the decision even further.

The perceived risk explanation a likely rationalization for the results of this study. During post-experimental debriefings a common explanation for subjects choosing the risky alternative in the gain frame condition was: "No matter what choice I made I was under the budget, so why not pick the risky supplier and hope that they come in at the low bid price?" Alternatively, a common comment for subjects in the loss condition was: "It didn't matter which supplier we chose because we were over the budget anyway. So, we chose the certain supplier's bid because the risky supplier might come in way over budget."

In summary, one of the differences between the operationalization of decision frame in previous studies and the present research is the personal relevance of the decisions that had to be made. In previous studies, the personal relevance of the consequences of subjects' decisions was high and the effect of the decision frame was explained by prospect theory. In the present research, the personal

relevance of the decisions that had to be made was low, and the effect of the decision frame can be explained by perceived risk.

In organizational buying, evidence for the effect of decision frame has been provided by Puto (1987), Schurr (1987), and Qualls and Puto (1989). However, the existing evidence is by no means certain. For example, Schurr (1987) found that bargainers whose payoffs were framed in terms of net profits obtained less risky outcomes (in terms of expected profit per unit for each of three commodities) than bargainers whose payoffs were framed in terms of expenses. However, he found no support for the effect of decision frame on a buyers initial preferences for risky alternatives in two experiments, one using MBA students and one using buyers from the National Association of Purchasing managers.

In a study using senior- and middle-level corporate managers and university administrators, McGuire, Kiesler, and Siegel (1987) found that, for two separate loss problems, a significant majority of subjects chose the risk averse alternative for two capital investment alternatives. This result in not consistent with the predictions of prospect theory but may be consistent with the notions of perceived risk.

Finally, the results of this study provide some support for the effect of decision frame on supplier choice and risk

preferences. However, the effect of the decision frame found in this study is opposite that proposed by prospect theory. It is, however, consistent with what would be expected if subjects were motivated to reduce perceived risk. The next section will discuss the problem of lack of significant results from the influence manipulations used in this research.

Lack of Significant Results. The lack of significant results from this research is a serious problem. Twelve of the eighteen hypotheses advanced herein were nonsignificant. The primary cause for the lack of significant results was the failed influence manipulation. The failed manipulation made it necessary to form groups based on mean splits for normative and informational statements generated during the group discussions. This resulted in twelve available groups to test hypotheses regarding the normative influence condition and eleven groups available to test hypotheses for the informational influence condition.

In the original study design, thirty-two groups were available to test hypotheses for both the normative influence and informational influence condition (i.e., sixty-four groups in total). The failed manipulation greatly reduced the power of the experiment to detect differences attributable to group influence.

In addition, the influence manipulations and measures

did not conform to the choice dilemma questionnaires commonly used to assess the group-induced choice shift observed in previous studies. In fact, several researchers have proposed that groups do not induce a choice shift at all (see, for example, Cartwright 1971). These researchers propose that the observed choice shift may be simply an artifact of the choice dilemma questions themselves (i.e., the operationalization). This research attempted to overcome this criticism by exploring choice shift using a measure other than the traditional choice dilemma questionnaire.

Given the lack of statistical power, it is impossible to decipher between the power explanation and the operationalization explanation for the lack of effect of group influence. Future studies need to eliminate lack of power as one possible explanation.

These observations suggest several directions for future research in the area of buying center decision making. The next section will discuss these directions.

Directions for Future Research

The results of this study suggest new directions for future research. It seems that the present research was far too complex for a preliminary study in the area of buying center decision making. The next study should continue to explore the effect of decision frame and group influence on buying center choice. However, several changes need to be

made. First, given the results of this research, the next study should conduct a critical theory test of the effect of decision frame by pitting the predictions offered by prospect theory and those offered by the theory of perceived risk against each other.

It appears that these theories offer opposing predictions for the effect of the decision frame. Prospect theory proposes that a gain frame will lead individuals to choose the cautious alternative and a loss frame will lead individuals to choose the risky alternative. The theory of perceived risk proposes that a gain frame will lead individuals to choose the risky alternative and a loss frame will lead them to choose the cautious alternative. It may be that the organizational context causes the predictions of the theory of perceived risk to predominate over the predictions offered by prospect theory.

Second, it would be wise to initially eliminate hypotheses exploring the differential impact of normative and informational influence in buying groups until some empirical effects can be demonstrated for group influence (in general) on buying center choice and risk preference. This would circumvent the failed influence manipulation situation that was encountered in this research and allow for a more powerful test of the hypotheses. Therefore, the next logical research project would involve a critical test of pros-

pect theory versus perceived risk and the effect of buying center influence on the choices made under the gain and loss decision frames.

In addition to exploring the effect of a fixed decision frame for all group members on group choice, continuing research needs to determine the effect of multiple decision frames on group choice. For example, what occurs in a group when some members have framed the decision as a gain and others have framed the decision as a loss?

Future research also needs to explore the effects of other important independent variables on group choice. These include, but are not limited to the effect of group size, acquaintanceship, gender differences, and others that have been shown to affect group choice in other contexts.

Limitations

This work also has theoretical and methodological limitations. From a theoretical perspective, one possibility concerning polarization is not addressed in this study. There is the possibility that individual buying center members may not all have the same initial predisposition toward either risk or caution during a specific supplier selection decision. For example, there may actually be two or more coalitions (e.g., an in-group and an out-group) within the buying center, each with their own preferences (e.g., pro-supplier A and pro-supplier B) concerning

the choice of a product or supplier (Isenberg 1986). This is an interesting situation since one theory of polarization (i.e., social comparison theory) would predict that members of one subgroup would compare themselves to their own subgroup and become more pro-supplier A, while members of the other subgroup would compare themselves to other members of their subgroup and become more pro-supplier B. This results in further polarization between the two groups.

On the other hand, persuasive arguments theory argues that within each subgroup most of the arguments favoring either supplier A or supplier B will be shared and there will be relatively few novel, valid (and thus persuasive) arguments within subgroups. However, between subgroups new arguments will be heard, facilitating a shift toward the other subgroup, and depolarization will be observed. Unfortunately, it is not possible to include these dynamics in the present research, but will have to be left to future research in the area.

In addition, this research failed to explore other group phenomena such as social facilitation, social loafing, deindividuation, and minority influence.

Methodologically, although laboratory experiments may have high internal validity, they also may have limited generalizability. The generalization of experimental findings from student samples to organizational buyers may be

questionable, necessitating follow up research in the field. Furthermore, contextual factors found in the field but not represented in the laboratory may mitigate any effects that are found between independent and dependent variables. Generally speaking, to the extent that any treatments or independent variables interact with either the attributes of the people being studied or the settings, generalizations will be limited (Pedhazur and Schmelkin 1991).

Contributions to Knowledge

The greatest contribution of this research are the theoretical notions that have been proposed regarding the formation of individual buying choices and preferences and how these choices and preferences are likely to change as a result of buying center interaction or group influence.

The conclusions from this research do not dispute that the decision frame used by buyer's affects their choices. They do however question the direction of the effect. Therefore, the following discussion is based on the premise that the decision frame does have an effect on choice. Furthermore, this section assumes that the theoretical notions advanced herein are still probable and the reason for a lack of support was methodological not theoretical.

Theoretical Contributions

The importance of knowing whether and under what circumstances buying groups make more (or less) risky decisions

than individual buyers has implications for organizational buying and personal selling. Situations in which there may be some question as to whether groups or individuals should make organizational choices include: (1) choosing between a number of alternative suppliers for a specific procurement; (2) negotiation with a single supplier for detailed contract terms; and (3) and make or buy decisions within the firm.

Choosing Between Suppliers. If the choice of a supplier is made by a single individual (e.g., the purchasing agent), the buyer's initial reference point combined with contextual factors such as the alternative suppliers in the choice set probably results in a decision frame that is used by the buyer to make a choice. According to prospect theory, buyer's choices that are framed as gains will tend to result in risk averse choices, while those framed as losses will tend to result in risk taking choices (Qualls and Puto 1989, Puto 1985, 1987). The theory of perceived risk makes the opposite predictions.

The result is that a potentially risky supplier could be chosen over a more cautious supplier depending on the framing effect. Furthermore, if the choice of a supplier is to be made by a group, each individual's choice in the group is expected to depend on this same framing effect. That is, decisions framed as gains tend to lead to cautious choices while those framed as losses tend to lead to risky choices

(i.e., for prospect theory predictions, of course the opposite would be predicted by a theory of perceived risk). However, upon group interaction, these choices may polarize toward more extreme positions in the same direction. The result is that an even more risky supplier could be chosen by the group than by an individual depending on the framing effect. The result could be detrimental for the firm if an extremely risky supplier was chosen by the group and fails to perform contract obligations.

Whyte (1989) has applied this same basic reasoning to explain decision fiascoes such as Vietnam, the Bay of Pigs invasion, the Watergate cover-up, the Iran-Contra affair, and the Challenger disaster. Individuals initially predisposed toward risky alternatives, followed by group interaction, can make group choices that are extremely poor.

Negotiation and Bargaining. The importance of group induced choice shifts also has implications for negotiation and bargaining. Shifts in demand levels by negotiating parties caused by group interaction have been demonstrated (Dwyer 1984, Lamm 1988). Generally, this research has shown that group discussion leads to a higher level of initial demands prior to bargaining.

Negotiation between two organizations will only occur if there is some overlap between the minimum and maximum acceptable range of the buyer and the minimum and maximum

acceptable range of the seller (see Figure 6-1A). The polarization effect is proposed to operate prior to the actual negotiation, when the negotiation group meets to discuss negotiation strategies. If the negotiation is framed as a loss, the initial demand level may rise during group interaction, so that a higher level of demand is agreed upon. If both organizations use negotiation teams and both frame the negotiation as a loss, then a shift in both of their initial demand levels might be expected. This could lead to a shift in demand for each party which either reduces the negotiation room for agreement, or eliminates any range for agreement to take place (see Figure 6-1B). In this case, both the buyer and seller can lose the window of opportunity for a mutually beneficial buyer-seller relationship to develop.

Choice shift could also cause negotiation participants to engage in more competitive bargaining behavior, since the initial group demand levels of both parties would be set at

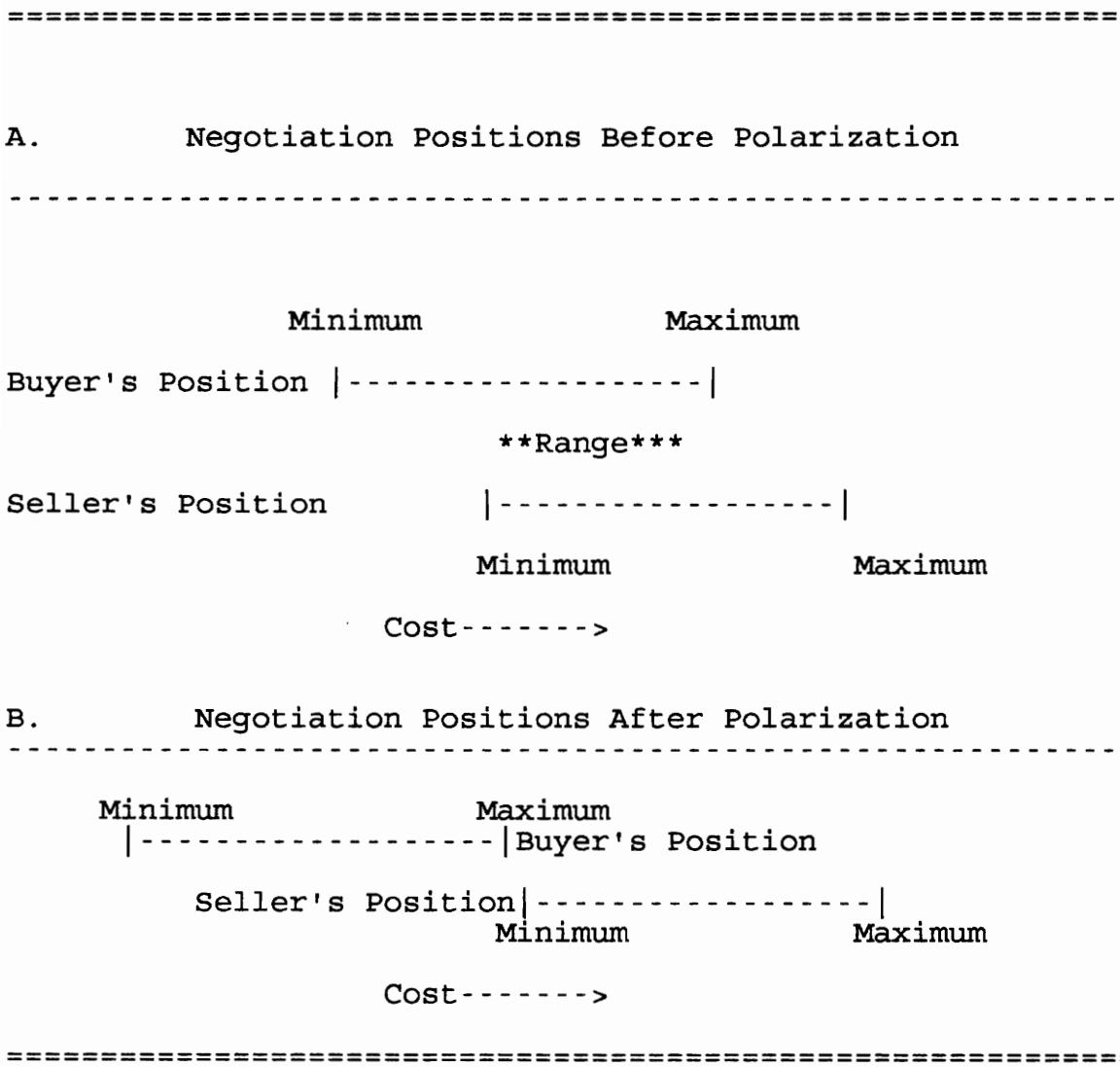

Figure 6-1
Effect of Polarization on Negotiation Range

Adapted from Dobler, Lee, and Burt (1984).

an artificially high level.

Make or Buy Decisions. Decisions concerning whether a product or service should be purchased or produced in-house can be made individually or by a group designated to evaluate the make-or-buy decision. Many progressive firms use the committee approach to analyze make-or-buy alternatives (Dobler, Lee, and Burt 1984). The committee approach suggests that all departments which can contribute to the decision, or which are affected by it, should have a voice in making the decision. Presumably, the assumption is that this group effort reduces the risk to the firm of making an incorrect or suboptimal choice.

The decision to make or buy can be critical to a firm in terms of cost, the protection of proprietary knowledge, production requirements, etc. When all make-or-buy committee members lean toward a decision such as making rather than buying, or all make-or-buy committee members lean toward a decision such as buying rather than making it might be expected that after committee discussion, the group would lean more heavily toward the initial predisposition (i.e., make or buy). In this case, group dynamics may circumvent a more careful consideration of the alternative option, or more neutral options, such as make and buy.

Personal Selling. Knowledge of the factors that affect choices in the organizational buying context have been a

major part of the work conducted on organizational buying in marketing. This work has focused around the buying process, buying classifications, buying determinants, and information sources used by those involved in the purchase decision (see Moriarty and Galper 1978 for a review).

The limited work that has been conducted on the effect of framing on choice has shown that the sales message delivered to a buyer can affect the frame that is used to make a choice, consistent with the predictions of prospect theory (Puto 1985, 1987). However, this area of knowledge is lacking in that no connection has yet been made concerning the effect of framing on buying center choice. Furthermore, there is a building body of evidence to suggest that the decision frame has the opposite effect as originally expected.

Knowledge of the effect of decision framing on group choice would facilitate the ability of the salesperson to tailor sales messages to achieve desirable outcomes. For example, if the predictions offered by prospect theory are true, an out-supplier could frame messages that are directed to buying center members as losses, so that consideration of the out-supplier would be enhanced. The out-supplier might state that failure to consider their firm could result in losses to the competition. In this case, the framing of sales messages as losses could result in buying center

members being predisposed to a more risky supplier than the current supplier. Upon group interaction, polarization could reinforce and extremitize these views, giving the out-supplier a better chance at getting the business. Of course, the sales person would want to frame the decision as a gain if the predictions of the theory of perceived risk are more likely.

In summation, the question of whether and under what circumstances groups make more risky choices than individuals has implications for organizational buying, negotiation and bargaining, make or buy decisions, and personal selling.

Although the results of the present research are meager, the theoretical notions advanced herein offer the potential for significant contributions in marketing and psychology. In marketing, research in this area contributes to a better understanding of several important issues in organizational buying behavior. These issues include: (1) how a buyer's decision frame affects his or her initial predispositions; (2) how the initial predispositions of buyers are affected by buying center interaction; (3) how the type of buying center interaction affects the degree of attitude polarization; and (4) what effect contextual factors have on the degree of attitude polarization during buying center interaction.

For psychology and social science in general, this

research integrates prospect theory with theories of social influence to explain group choice. This conceptual integration may assist researchers in predicting and explaining the formation of an individual's attitudes depending on the decision frame, and then predict and explain how these attitudes will change during interaction with others given certain contextual factors. This can be seen as an extension of the decision framing process to groups.

Appendix 1
Sample Experimental Booklet

R.B. Pamplin College of Business
Virginia Polytechnic Institute and
State University

Rev. 1/93

Case Development Survey

We are developing a set of case materials for the industrial marketing course. These materials are based on actual purchase decisions that have been made at Virginia Tech. We would like to develop short cases for which people are likely to hold many different points of view. We want to see whether the organizational buying situations we constructed will aid students in learning to make purchasing decisions. Therefore, we are interested in your recommendations for each of the attached organizational buying situations. Your choices will be useful in developing standards for students who will use these cases in industrial marketing.

On the following pages you will find two actual buying decisions faced by the Purchasing Department at Virginia Tech. We would like your opinions regarding certain aspects of each of these choices. In each procurement situation, imagine that you are the buyer faced with making a choice between two vendors. In each case, one vendor is more desirable and attractive than an alternative vendor, but there is some degree of uncertainty regarding one aspect of the more desirable vendor.

As the buyer, you have the sole responsibility of awarding a contract for the products needed in the continued operation of the university. The vendors that you will consider are approximately equal with respect to the quality of their products.

According to university policy, your compensation is based primarily on cost reduction considerations. Cost reduction is the primary consideration used by the purchasing vice president for your performance evaluation. In the past, those buyers who contracted under budget received good evaluations. Those buyers who contracted over the budget received poor evaluations. Also, buyers who were able to provide justifiable arguments in support of their decisions were favorably evaluated. For these cases, your performance will be judged by the extent to which you are over or under the budget and the reasoning behind your choice in the contracts with your vendors.

Read each purchase situation carefully before giving your judgement. We know the information upon which you have to make a choice is limited, but it is essentially what was available to the actual buyers in these situations. Remember, you are the buyer in each of the situations. There are two cases, please do not omit either case.

Appendix 1 (Continued)
Sample Experimental Booklet

R.B. Pamplin College of Business
Virginia Polytechnic Institute and
State University

Rev. 1/93

Prologue

These cases were designed to be read in a specific order. It would be a great help to us if you were to respond to each case in the order in which it is presented.

After completing the cases, please leave them on your desk. Then, return to the conference room.

Please put the last four digits of your social security number here:

_____

Appendix 1 (Continued)
Sample Experimental Booklet

R.B. Pamplin College of Business
Virginia Polytechnic Institute and
State University

Rev. 1/93

Musical Instrument Procurement (A)

The Department of Music at Virginia Tech has recently submitted a request to the purchasing department for a new harpsichord. In response to this request, the purchasing department issued a request for proposals to several harpsichord manufacturers who were recommended by the music department faculty. Only two of the harpsichord manufacturers met bid specifications.

As the buyer of musical instruments for Virginia Tech, you must decide between the two manufacturers for the construction of a Franco-Flemish double manual harpsichord. The two sources under consideration are the only builders that met bid specs. The budget allocation for this procurement is $350,000.

The first manufacturer, Pinnoforte, has submitted what is considered to be a certain bid price of $270,000 for the construction of the harpsichord. The second manufacturer, Klavenspiel, has submitted what is considered to be an uncertain bid price of $230,000 for construction of the same quality harpsichord.

A recent Business Week report indicates that there may be some question regarding Klavenspiel's financial stability. However, Fortune Magazine says that they are financially sound. If Klavenspiel fails to perform, it could result in a total cost of $310,000.

As you can see, the cost to the university for either harpsichord will be under the budget of $350,000, resulting in a budget surplus. Depending on the manufacturer chosen, the cost to the university could be either:

1) Pinnoforte - $270,000 certain bid.
2) Klavenspiel - Either $230,000 or $310 depending on Klavenspiel's performance.

This case was prepared as a basis for class discussion rather than to illustrate effective or ineffective handling of an administrative situation.

Appendix 1 (Continued)
Sample Experimental Booklet

1. Which manufacturer would you choose for the job?

   1) Pinnoforte
   2) Klavenspiel

2. How certain does Klavenspiel's $230,000 price have to be for you to contract with them? Place a slash (|) on the line that best represents how certain you would have to be.

Completely Uncertain — Completely Certain

|----------|

Appendix 1 (Continued)
Sample Experimental Booklet

R.B. Pamplin College of Business
Virginia Polytechnic Institute and
State University

Rev. 1/93

Audio-Visual Purchase (A)

The Media Services Division of Virginia Tech has recently requested software projector panels so that computer graphics can be displayed on existing overhead machines. The purchasing department issued requests for proposals for software projector panels to several manufacturers. Only two of the software projector panel manufacturers met bid specifications.

As the buyer for audio-visual products for Virginia Tech you must select one company to provide the thirty-two software projector panels. The LCD panel budget has been set at $370,000.

One manufacturer, A-V Equipment and Supplies, will provide the panels for what is considered to be a certain bid price of $450,000. A second manufacturer, Boxlight, will provide the same quality projector panels for what is considered to be an uncertain bid price of $410,000.

You have contacted some of Boxlight's previous customers. Half of the previous customers said that Boxlight had no trouble meeting deadlines, and the other half said there may be some trouble. If deadlines are not met, it could result in a cost of $490,000.

As you can see, the cost to the university will be over the budget of $370,000 resulting in a budget deficit. Depending on the supplier chosen, the cost to the university could be either:

1) A-V Equipment and Supplies - $450,000 certain bid.
2) Boxlight - Either $410,000 or $490,000 depending on Boxlight's performance.

This case was prepared as a basis for class discussion rather than to illustrate effective or ineffective handling of an administrative situation.

Appendix 1 (Continued)
Sample Experimental Booklet

1. Which manufacturer would you choose for the job?

1) A-V Equipment and Supplies
2) Boxlight

2. How certain does Boxlight'ss $410,000 price have to be for you to contract with them? Place a slash (|) on the line that best represents how certain you would have to be.

Completely Uncertain — Completely Certain

|----------|

Appendix 2
Service Procurement Scenarios

R.B. Pamplin College of Business
Virginia Polytechnic Institute and
State University

9-575-103
Rev. 12/92

PRINTING SERVICE PROCUREMENT (A)

The Athletic Department at Virginia Tech has recently submitted a request to the purchasing department for 175,000 football schedules for next year. In response to this request, the purchasing department has issued a request for proposals to several printing companies. Only two of the printing companies met bid specifications.

As the buyer for printing equipment, supplies and services you must select one of the two printing companies to prepare next years football schedules. Next year, there will be six home games for which schedules will be needed. The budget for the schedules has been set at $350,000.

One printer, Southern Printing can prepare the schedules for a price of $430,000. A second printer, Color Images has agreed to prepare the same quality color schedules for a price of $390,000.

One aspect in the football schedule purchase that is crucial is delivery time, since late football schedules will be useless. Being a new company there is some question as to whether Color Images will be able to meet the delivery deadline. If Color Images does not deliver the schedules in time, rush printing could result in a cost of $470,000.

In summary, the cost to the university will be slightly over budget resulting in a deficit for this year. Depending on the printer chosen, the cost to the university could be either:

1) Southern Printing - $430,000 certain bid.
2) Color Images - Either $390,000 or $470,000 depending on Color Images performance.

Appendix 2 (Continued)
Service Procurement Scenarios

R.B. Pamplin College of Business
Virginia Polytechnic Institute and
State University

9-575-105
Rev. 12/92

COLLECTION SERVICE PURCHASE (A)

The Accounts Receivable Division at Virginia Tech has recently requested that the purchasing department contract with an outside company to collect on defaulted student loans. Together with accounts receivable, the purchasing department has issued a request for proposals to several collection agencies. Only two of the collection agencies met bid specifications.

As the buyer in charge of university contracts for goods and services you must choose one of the two collection agencies to provide collection services for the bursars office for defaulted Perkins Loans (i.e., student loans). The collection service involves a reasonable number of telephone calls, no less than five mail efforts, and skiptracing procedures. The budget for this procurement is set at $350,000.

One agency, Credit Bureau Services, has agreed to provide the service for $390,000. Another agency, Double Check has also agreed to provide the same quality service, but for $370,000.

You have noted that Double Checks experience at collections is substantially less than that of Credit Bureau Services. If the collections are not made on a timely basis it could cost the university $410,000.

In summary, the cost to the university will be slightly over budget resulting in a deficit for this year. Depending on the company chosen, the cost to the university could be either:

1) Credit Bureau Services - $390,000 certain bid.
2) Double Check - Either $370,000 or $410,000 depending on Double Check's performance.

Appendix 3
Experimental Plan

Experimental Plan*				
Group Number	1st Treatment Combination	2nd Treatment Combination	Influence Type	Number of Subjects
35	MI, Gain, Fin	AV, Loss, Per	Informational	4
45	MI, Loss, Fin	AV, Gain, Per	Informational	4
46	AV, Gain, Fin	MI, Loss, Per	Informational	4
11	AV, Loss, Fin	MI, Gain, Per	Informational	4
40	AV, Loss, Per	MI, Gain, Fin	Informational	4
54	AV, Gain, Per	MI, Loss, Fin	Informational	4
52	MI, Loss, Per	AV, Gain, Fin	Informational	4
53	MI, Gain, Per	AV, Loss, Fin	Informational	4
50	MI, Gain, Fin	AV, Loss, Per	Normative	4
51	MI, Loss, Fin	AV, Gain, Per	Normative	4
13	AV, Gain, Fin	MI, Loss, Per	Normative	4
12	AV, Loss, Fin	MI, Gain, Per	Normative	4
47	AV, Loss, Per	MI, Gain, Fin	Normative	4
18	AV, Gain, Per	MI, Loss, Fin	Normative	4
25	MI, Loss, Per	AV, Gain, Fin	Normative	4
32	MI, Gain, Per	AV, Loss, Fin	Normative	4
55	CS, Gain, Fin	PS, Loss, Per	Informational	4
4	CS, Loss, Fin	PS, Gain, Per	Informational	4
29	PS, Gain, Fin	CS, Loss, Per	Informational	4
44	PS, Loss, Fin	CS, Gain, Per	Informational	4
5	PS, Loss, Per	CS, Gain, Fin	Informational	4
22	PS, Gain, Per	CS, Loss, Fin	Informational	4
14	CS, Loss, Per	PS, Gain, Fin	Informational	4
56	CS, Gain, Per	PS, Loss, Fin	Informational	4
48	CS, Gain, Fin	PS, Loss, Per	Normative	4

Appendix 3 (Continued)
Experimental Plan

Group Number	1st Treatment Combination	2nd Treatment Combination	Influence Type	Number of Subjects
33	CS, Loss, Fin	PS, Gain, Per	Normative	4
62	PS, Gain, Fin	CS, Loss, Per	Normative	4
1	PS, Loss, Fin	CS, Gain, Per	Normative	4
3	PS, Loss, Per	CS, Gain, Fin	Normative	4
64	PS, Gain, Per	CS, Loss, Fin	Normative	4
38	CS, Loss, Per	PS, Gain, Fin	Normative	4
28	CS, Gain, Per	PS, Loss, Fin	Normative	4
30	MI, Gain, Fin	AV, Loss, Fin	Informational	4
42	AV, Gain, Per	MI, Loss, Per	Informational	4
10	AV, Loss, Per	MI, Gain, Per	Informational	4
36	AV, Gain, Fin	MI, Loss, Fin	Informational	4
20	AV, Loss, Fin	MI, Gain, Fin	Informational	4
57	MI, Loss, Per	AV, Gain, Per	Informational	4
9	MI, Gain, Per	AV, Loss, Per	Informational	4
17	MI, Loss, Fin	AV, Gain, Fin	Informational	4
37	MI, Gain, Fin	AV, Loss, Fin	Normative	4
21	AV, Gain, Per	MI, Loss, Per	Normative	4
41	AV, Loss, Per	MI, Gain, Per	Normative	4
43	AV, Gain, Fin	MI, Loss, Fin	Normative	4
6	AV, Loss, Fin	MI, Gain, Fin	Normative	4
27	MI, Loss, Per	AV, Gain, Per	Normative	4
59	MI, Gain, Per	AV, Loss, Per	Normative	4
31	MI, Loss, Fin	AV, Gain, Fin	Normative	4
61	CS, Gain, Fin	PS, Loss, Fin	Informational	4
15	PS, Gain, Per	CS, Loss, Per	Informational	4
39	PS, Loss, per	CS, Gain, Per	Informational	4
16	PS, Gain, Fin	CS, Loss, Fin	Informational	4
7	PS, Loss, Fin	CS, Gain, Fin	Informational	4

Appendix 3 (Continued)
Experimental Plan

Group Number	1st Treatment Combination	2nd Treatment Combination	Influence Type	Number of Subjects
19	CS, Loss, Per	PS, Gain, Per	Informational	4
63	CS, Gain, Per	PS, Loss, Per	Informational	4
49	CS, Loss, Fin	PS, Gain, Fin	Informational	4
8	CS, Gain, Fin	PS, Loss, Fin	Normative	4
58	PS, Gain, Per	CS, Loss, Per	Normative	4
26	PS, Loss, Per	CS, Gain, Per	Normative	4
2	PS, Gain, Fin	CS, Loss, Fin	Normative	4
24	PS, Loss, Fin	CS, Gain, Fin	Normative	4
60	CS, Loss, Per	PS, Gain, Per	Normative	4
23	CS, Gain, Per	PS, Loss, Per	Normative	4
34	CS, Loss, Fin	PS, Gain, Fin	Normative	4

*Key:
MI = Musical instrument procurement scenario.
AV = Audio-visual procurement scenario.
CS = Collection service procurement scenario.
PS = Printing service procurement scenario
Gain = Gain frame.
Loss = Loss frame.
Per = Performance risk attribution for uncertainty for risky supplier.
Fin = Financial risk attribution for uncertainty for risky supplier.

Appendix 4
Influence Manipulations - Service Procurements

R.B. Pamplin College of Business
Virginia Polytechnic Institute and
State University

9-575-107
Rev. 12/92

PRINTING SERVICE PROCUREMENT (B)

The actual buyers for printing equipment, supplies, and services have recently met to discuss the contract for the printing of football schedules. The following is an excerpt from their discussion. Lisa Martin summarized the purchase decision:

"We have to decide between two printers to prepare next years football schedule. We've got $350,000 to spend. Southern Printing has submitted a bid price of $430,000 and Color Images has submitted a bid price of $390,000 for the same quality schedules."

"One aspect in the purchase is that Color Images is a new company, and I'm not sure that they will be able to meet the delivery deadline. If the deadline isn't met it could cost us $470,000. How do you guys feel?"

Jim Dunlap...."Color Images has a six color printing capability for their schedules."

Carolyn Underwood...."Color Images has offset printing machines rather in addition to photocopying capabilities."

Jennifer Tarkington..."Color Images also has 11" by 17" printing capability."

Lisa Martin..."Color Image's price includes saddle stitching."

Appendix 4 (Continued)
Influence Manipulations - Service Procurements

R.B. Pamplin College of Business
Virginia Polytechnic Institute and
State University

9-575-109
Rev. 12/92

COLLECTION SERVICE PURCHASE (B)

The actual buyers for university contracts for goods and services met to hire a collection agency to provide collection services for the bursars office for defaulted Perkins Loans (i.e., student loans). The following is an excerpt from their discussion. Bill Perreault summarized the purchase decision:

"As you know, we must contract with a collection service to collect on defaulted student loans. The contract will allow for a reasonable number of telephone calls, no less than five mail efforts, and skiptracing procedures. The budget for this procurement is set at $350,000. Credit Bureau Services has agreed to provide the service for $390,000 but Double Check has agreed to provide the same quality service, but for $370,000."

"I'd like to point out that Double Checks experience at collections is substantially less than that of Credit Bureau Services. Furthermore, if the collections are not made on a timely basis it could cost the university $410,000. I'd like your input on this decision."

Bob Duncan...."Double Check has provided a good plan for providing the collection service."

Becky Litton...."Double Check has provided samples and explanations of literature, letters, notices, forms and statements used to collect debts owed."

Tom Moses..."Double Check has also provided evidence of affiliation with professional associations."

Bill Perreault..."Double Check has provided us with the resumes of all staff that will be committed to the contract."

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