This is to certify that the

thesis entitled

INFORMATION DISTRIBUTION, SOURCE CREDIBILITY AND CLAIM STRENGTH AS DETERMINANTS OF ORGANIZATIONAL PURCHASE OUTCOMES: AN EXPERIMENTAL APPROACH

presented by

Robert E. Krapfel Jr.

has been accepted towards fulfillment of the requirements for

Ph.D. degree in Business Administration

Major professor

Date July 2, 1979

O-7639

INFORMATION DISTRIBUTION, SOURCE CREDIBILITY AND CLAIM STRENGTH AS DETERMINANTS OF ORGANIZATIONAL PURCHASE OUTCOMES: AN EXPERIMENTAL APPROACH

by

Robert E. Krapfel, Jr.

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Marketing and Transportation Administration

1979

ABSTRACT

INFORMATION DISTRIBUTION, SOURCE CREDIBILITY AND CLAIM STRENGTH AS DETERMINANTS OF ORGANIZATIONAL PURCHASE OUTCOMES: AN EXPERIMENTAL APPROACH

by

Robert E. Krapfel, Jr.

Thoughtful marketers, academic and practitioner alike, have long recognized that the characteristics of organizational customers and the products they purchase necessitate marketing strategies different from those applied in consumer goods markets. Chief among these differences are directness of distribution channels and emphasis on personal selling in promotional effort.

Recently many students of organizational purchasing have emphasized behavioral dimensions of buyer-seller relationships to better understand their dynamics. This research focuses on a process approach to group decision making in the buying center. A deductively developed causal model hypothesizes three vendor influenceable variables, information distribution, source credibility and claim strength, as determinants of the willingness of one or more buying center members to assume an advocate role. Furthermore the model posits that perceptible advocacy behavior influences group vendor selection.

The model was tested by means of two experiments. The first was a factorial design employing MBA students as subjects. The second was a crossed and nested repeated measures design employing technical and managerial practitioners. In both experiments groups rather than individuals were the unit of analysis. Multivariate and univariate analysis of variance of multiple-item scale dependent variable data were conducted for the purpose of model validation.

Complete model validation was obtained with the practitioner sample while partial validation and evidence of interaction effects were found with the student participants. Model validation provides evidence of linkage between the independent factors mentioned and problem specific self-confidence through which advocacy behavior and finally vendor choice are influenced.

In addition to theoretical conclusions resulting from validation of the model managerial implications are provided as well. Sales representatives may now influence not only what is discussed in group deliberations but the manner in which it is discussed as well. In the context of this new process model vendor representatives who correctly facilitate advocacy behavior by one or more influential buying center members enjoy enhanced probability of success.

ACKNOWLEDGMENTS

I would like to express sincere gratitude to my parents who taught self-reliance at an early age, to my wife Gabriella who counselled and occasionally prodded, to my committee, and especially Dr. Gilbert Harrell, who allowed me necessary latitude, to Mr. Don Moyer who took extraordinary pains to help make the practitioner sample a reality and to Ms. Scotti Lucasse who taught me several things about the English language.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Chapter I

INTRODUCTION

Study of organizational buyer behavior has greatly increased in recent years. With this acceleration of activity has come a proliferation of concepts and models designed to explain behaviors exhibited by individuals performing purchasing functions in organizations of various types.

Unfortunately, the subject of buyer behavior in general remains an abstruse topic for many marketing practitioners and academicians alike. Explanations for this vary; however, the manner of model development may be suggested as one causal factor. Beginning with motivation research in the late 1950's and continuing through the currently popular multi-attribute decision models, buyer behavior researchers have held out the promise of behavioral prediction. All too often that promise has remained unfulfilled due to an uncritical adoption of theory generated in other disciplines. While some marketing students have been successful in creating "new" theoretical constructs, much of the development process remains dependent on building blocks borrowed from others.

Under these circumstances the marketer bears responsibility for making those adaptations required to achieve congruence between model and environmental context. Further, given the state of development of organizational buyer behavior theory, it is inappropriate to suggest that prediction should be the primary objective of research.

In light of these considerations, the research described on the following pages is presented as an example of an appropriate approach to the development of deductively generated causal theories of organizational buyer behavior. In particular, it reports on the development and

testing of a model of small group decision-making processes specifically geared to the organizational buying environment. While the particular model under study is of substantive theoretical interest, the procedure used to generate and test it may be of greater long-run significance and so methodological issues receive consideration accordingly.

THE PROBLEM

Nature of the Problem

Thoughtful marketers have long recognized that the characteristics of organizational customers and the products they purchase necessitate approaches somewhat different from those used in the consumer goods sector. While the elements of marketing strategy planning and execution remain fundamentally the same, their relative importance and emphasis shift in moving from consumer to organizational markets.

Principal among these differences is the directness of the distribution channels employed and the proportion of promotional effort allocated to personal selling. It is widely accepted that personal selling is the predominant element in the typical industrial marketer's communications mix. In many cases this selling is performed by the vendor's own sales force calling directly on users and buyers in customer firms.

Owing to the importance of the sales representative's mission, and the time and dollar commitment made in developing and supporting an effective sales force, industrial marketing managers are continually seeking ways to improve the effectiveness and efficiency of selling operations. Articles on compensation plans, quota setting, territory definition, motivation and other sales management issues are commonplace in the literature.

Recently, in some circles, attention has shifted somewhat as we become more aware of the fact that these buyer-seller linkages are made, not between large monolithic corporate entities, but between individuals who are pursuing a wide range of personal, as well as corporate goals. When vendor representatives call on corporate purchasing or operational managers, they are entering into multi-faceted relationships whose nature is influenced by a vast array of factors. Parties on both sides harbor expectations about the parameters that define these relationships. Furthermore, each is constantly attempting to induce the other to undertake a course of action that will result in accomplishment of certain desired ends.

In many respects the buyer-seller relationship is an adversary one. This is true because the marketing concept in its purest form remains largely a textbook notion. This is not to say that firms do not strive for what the concept espouses, rather that devotion to its precepts often is swept away by the exigencies of day-to-day operations. Given that the atmosphere between buyers and sellers is not one of complete openness and cooperation, and that each vendor faces competitive pressure from others, those sales representatives having a better understanding of their customers hold a competitive advantage.

A typical representative approaches potential customers armed with a battery of information concerning his product offerings and, perhaps, those of his competitors. In addition, he usually has in mind a particular method of approach designed to demonstrate to the customer the benefits accruing from the purchase and use of his offerings. All too often, however, his knowledge of the real needs of that customer are fragmentary at best. And, even if he has called on that account for several years, he may have only a minimal understanding of the policies,

procedures and processes which govern vendor selection for a given product at a given point in time.

Thus, while he may be very cognizant of the strengths and weaknesses of his own offering, he may be very much in the dark concerning the inner workings of a potential client firm. This condition is characteristic of a sales rather than marketing approach and not at all surprising. Many firms purposefully prevent vendor contact with certain individuals and often, even when no formal prohibitions exist, the representative is unable to identify and approach those most influential in a particular decision. In some instances, job responsibilities are in a state of flux and management inside the customer firm may not know themselves who is currently responsible for a particular area!

Assuming that the one or more relevant individuals are known, the representative yet lacks guidelines as to how he is to present both the product and himself. Much will depend on the particular criteria being employed for vendor selection at this juncture.

These criteria are themselves multi-dimensional and can be traced to numerous sources. In the last several decades, considerable industrial marketing research has been devoted to the task of enumerating and categorizing the factors that impinge on product and vendor selection.

Melvin Copeland, in 1924,[1] produced a list of twenty-five buying and patronage motives commonly appealed to by industrial advertisers. The twenty-five were generated by noting frequency of appearance in trade publications then available. Fifty years later, to the month, Lehman and O'Shaughnessy[2] published a study on differences in product/vendor attribute importance in various situations. They interviewed purchasing agents in several firms asking them to rate selection criteria by importance in specific decisions.

Tabulated below are the ten primary criteria cited in each study.

Table 1

Product/Vendor Selection Criteria: 1924 vs. 1974*

Copeland	Lehman and O'Shaughnessy
Economy in use	Technical performance
Protection against loss	Product reliability
Enhancement of plant productivity	Price
Dependability in use	Ease of use
Dependability in quality	Post-sale service
Reliability of seller	Supplier reputation
Punctuality of delivery	Delivery reliability
Promptness of delivery	Supplier past experience
Exact specification fulfillment	Technical service
Variety of selection	Flexibility to meet specifications

The purpose in presenting this comparison is not to demonstrate how little things have changed in the past fifty years, but to suggest that, in general, a rather clear picture of salient selection criteria has emerged and that the task remaining is specification of those subsets of criteria invoked in particular circumstances. Other and yet still fundamental issues remain unresolved.

For example, one of the earliest attempts at categorizing buying motives centered about the supposed dichotomy between rational and emotional factors. All of the entries in Table 1 are what would be called rational criteria. Examples of emotional criteria include buyer-seller friendship, desire for status enhancement, non-functional obsolescence, etc. This rational-emotional split has been a source of extensive debate among industrial marketers.

Discussions by P. D. Converse in 1930,[4] and Maynard, Weidler and

*The factors attributed to Copeland appear in Principles of Merchandising published in 1925.[3]

Beckman in 1939,[5] clearly indicate the prevailing attitude of early marketing scholars. Rational motives predominate in the purchase of industrial goods; however, when competing suppliers' offerings are approximately equivalent, emotional criteria may swing the balance. Thus their advice to industrial marketers was to emphasize product performance and reliability, but to be prepared to appeal to other, lesser motivations if the choice seemed in doubt.

Today, we continue to speak of the difference between performance and emotional appeals in our basic texts,[6] and task vs. non-task decision elements in more specialized monographs.[7] There is today, however, a better appreciation of the idea that these classes of motivations or criteria are not mutually exclusive in any way and that they interact continually as individuals and groups process information.

To better understand the interplay of these factors, a more useful dichotomy than rational vs. emotional, is one which distinguishes between attribute variables and process variables. Attribute variables are all those describing what information it is that gets processed. Price, performance, quality and reliability are product attributes. Delivery time, stock-out frequency and post-sale service are supplier attributes. Punctuality, appearance and product knowledge are sales representative attributes. To date the bulk of published industrial marketing research has been concerned with attributes and their relative impacts on purchase decisions.

It has only been relatively recently though that attention has turned to the question of how information about attributes is utilized, or for that matter, if it is utilized at all. Consider the purchasing agent provided a sales brochure comparing two vendors' offerings in which one of the two is clearly shown to be superior. What determines if that

information is to be taken at face value or discounted in some way? Further, once assimilated individually, what conditions need be present for that individual to pass this information on to others, and under what conditions will that passage be as forceful advocacy rather than mere giving of information?

That is, process variables are those which determine how much information is passed along, when it is shared and in what manner. Examples of process variables include participation frequency and quality in group discussion.

Finally, it may be assumed that both process and attribute variables are, to a great extent, situation specific. That is, buyers might well emphasize different criteria in moving from a routine inventory replenishment buy to a new capital equipment acquisition and conceivably rules regarding number of participants and depth of inquiry might change as well.

Perhaps in certain situations most of the uncertainty associated with decision outcome can be traced solely to attribute variables, in which case processes take on little importance. However, it is a principal assumption in this study that in many cases the incremental variance attributable to processes is significant and worthy of explanation.

Research Purpose

This research has three primary objectives:

- Identification of factors relevant to group decision-making processes in an organizational purchasing context.
- Development of a causal model relating certain of those factors to vendor selection and other outcomes.

- Empirical evaluation of that model utilizing laboratory experimentation.

Research Questions

As mentioned above this research is an inquiry into decision-making processes and information utilization in small purchasing groups. The sales/marketing manager and field representative alike require a better understanding of the factors that impact on vendor selection. More specifically, each might conceivably raise the question, "What, if anything, can I do to influence the manner in which members of the buying center share information in the course of their deliberations?"

This perspective represents somewhat of a departure from the traditional interpersonal influence view of buyer-seller relations. In the traditional approach the task of the vendor is to persuade the buyer of the desirability of the vendor's offering. Several dyadic models now exist which alternatively conceptualize buyer-seller relations as bargaining games or social exchange processes.

However, in those situations where vendor selection is truly a group effort, the salesperson's task might better be conceptualized as a need to persuade one or more persons inside the buying center to advocate choice of a particular brand or product. Now the task is no longer to simply convince one person, but to convince one person (or persons) in such a way that they would be willing and able to convince others inside the buying center. The presumption of course being that movement to what might be called this extended interpersonal influence model would require an alteration of selling tactics.[8, 9, 10]

Implementation of this approach necessarily presumes that other avenues of gaining adoption have been or are being investigated and that

management is willing to explore possibilities other than the traditional marketing approaches, e.g., product modification, redirection of promotional message emphasis, etc. In this case, the question arises as to how vendor firm representatives might purposefully alter the internal workings of the customer firm buying center.

Do the bodies of theory mentioned above suggest guidelines as to whether or not this is feasible and if so, which approaches might be most fruitful in diverse circumstances?

The answer is a qualified yes. Research evidence suggests that when hierarchical position or status in the group is not externally imposed,[11] those individuals who participate more in small group discussions are given higher leadership and influence ratings by their peers when compared to those who participate less.

Furthermore, certain externally influenceable variables do appear to relate to the amount and quality of participation in discussion. For example, it has been demonstrated that an individual given sole possession of task relevant information receives higher ratings on both number and quality of contributions to the decision.[12]

These findings must be tempered by the caveat that they are the product of tightly controlled experimental settings. Nevertheless, they suggest an approach to the task of developing a model of group processes tailored to the problem initially posed.

Variable Specification

Group decision-making processes and outcomes have been studied from several points of view by individuals in numerous disciplines. These include communication theorists, social psychologists, counseling and training specialists, organizational behaviorists and so on. Each, in

turn, tends to emphasize variable sets peculiar to their research goals.

For example, organizational behaviorists seeking better understanding of group decision-making effectiveness have examined the impact of perceived role and authority structures on norm formation and rate of movement toward consensus. On the other hand, a communication student may wish to artificially restrict amount, timing or direction of verbal messages and measure the impact of this on time to completion of a task.

The variables selected for the present investigation are ones previous studies have shown to influence the extent and manner of use of task relevant information in group choice situations. These are drawn principally from the communication and social psychology literature.

Model Development

The second research objective is to develop a causal model which outlines the manner in which the variables described above relate to each other. This has been accomplished through a deductive reasoning process grounded in both group discussion and group choice theories. The model presented here incorporates elements and concepts originally developed in other disciplines and contexts, that have been adapted to study group decision making in an organizational purchasing environment.

It is important to note that the model is more normative than empirical in foundation. That is, it suggests an explanation of how individuals should act based upon certain deterministic theories.

Model Validation

Inasmuch as the model is presented as being of the causal variety, validation is presently possible through either the use of experiments or structural equations analysis. As the latter technique is still in its

infancy and its efficacy has not been conclusively demonstrated, a decision was made to conduct this phase of the research utilizing laboratory experiments. While experimental research is encumbered with difficulties of its own, primarily external validity, these have been accepted in order to provide evidence concerning the existence and direction of causal relationships. Too few of the current organizational buyer behavior models have been subjected to rigorous testing of this nature. And it is precisely because questions concerning model validity remain unanswered that potential users of these models often approach them with deserved skepticism.

Research Limitations

The principal limitations encountered in research of this type can be placed in either of two categories, i.e., scope of investigation and quality of operationalization. To a great extent these areas are synonymous with concerns over validity and reliability common to virtually all behavioral studies.

Research can be undertaken with any of several purposes in mind. Perhaps the most common taxonomy of research goals is one which presents the investigator as seeking to:

1. Describe observable behavior in a systematic fashion.
2. Understand behavior based on certain theoretically posited relationships.
3. Predict future behavior.

It has been suggested that often the type of research design appropriate to one goal is ill-suited to the others. Dubin[13] has characterized this as the power-precision paradox. The implication is that if

one sets out to develop a theory having good explanatory power, i.e., one designed to facilitate understanding, then that theory is quite likely to be weak in predictive precision.

The principal aim of this research is development and validation of an explanatory model, and so the research design necessarily focuses on only a small number of the variables known to be relevant to organizational buyer behavior. As expected, this narrowness in scope greatly limits the predictive validity of the study since only a small proportion of the variance associated with actual decision choices is likely to be accounted for.

The other major area of concern centers on the issue of reliability. Nunally[14] defines reliability in terms of the amount of random measurement error present. Reliability is improved when results are internally consistent and reproducible over time or instrument administrations. In the context of an experimental design such as the one being employed in this research, poor operationalization can cause a reduction in reliability in either of two ways.

First, the manner of treatment manipulation may be ambiguous resulting in a wide range of responses within a given treatment condition. Second, the procedure used to record responses may be ambiguous resulting in a large amount of measurement error.

Problems of the first sort can be detected through the use of manipulation checks. These are questions designed to determine if the experimental treatment has had the desired effect on the subjects. Problems of the second variety can be partially avoided by taking multiple measures of important dependent variables. The extent of such problems is determined by calculating inter-item correlations among dependent variable measures, which are reported as reliability coefficients.

Both manipulation checks and multiple item dependent measures have been incorporated in the research instrument to aid in detecting problems with operationalization in the model testing portion of the study.

REFERENCES

1. Copeland, Melvin T., "Buying Motives for Industrial Goods." Harvard Business Review, 2, (April 1924), 303-318.

2. Lehman, Donald R. and John O'Shaughnessy, "Difference in Attribute Improtance for Different Industrial Products." Journal of Marketing, 38, (April 1974), 36-42.

3. Copeland, Melvin T., Principles of Merchandising, Chicago: A. W. Shaw Co. (1925), chapters 5 and 7.

4. Converse, P. D., The Elements of Marketing, New York: Prentice-Hall (1930), 300-301.

5. Maynard, H. H., W. C. Weidler, and T. N. Beckman, Principles of Marketing, New York: The Ronald Press Co. (1939), 285.

6. McCarthy, E. J., Basic Marketing, Homewood, Illinois: Richard D. Irwin, Inc. (1978), 178.

7. Webster, Frederick E., Jr. and Yoram Wind, Organizational Buyer Behavior, Englewood Cliffs, N.J.: Prentice-Hall (1972), chapter 2.

8. Mathews, L. H., D. T. Wilson and J. F. Monoky, Jr., "Bargaining Behavior in a Buyer-Seller Dyad." Journal of Marketing Research, 9, (February 1972), 103-105.

9. Busch, P. and D. R. Wilson, "An Experimental Analysis of a Salesman's Expert and Referent Bases of Social Power in the Buyer-Seller Dyad." Journal of Marketing Research, 13, (February 1976), 3-11.

10. Wilson, David T., "Dyadic Interactions: Some Conceptualizations." Organizational Buying Behavior, Thomas V. Bonoma and Gerald Zaltman (Eds.), Chicago: American Marketing Association (1978).

11. Hoffman, L. R., "Group Problem Solving" in Advances in Experimental Social Psychology, L. Berkowitz (Ed.), v. 2, New York: Academic Press (1965), 101.

12. Collins, B. and H. Guetzkow, A Social Psychology of Group Processes for Decision Making, New York: John Wiley and Sons (1964), 29.

13. Dubin, Robert, Theory Building, New York: Free Press (1969), 19.

14. Nunnally, J. C., Psychometric Theory, New York: McGraw-Hill Book Co. (1967), 172-73.

Chapter II

LITERATURE REVIEW

In examining the impact of group discussion processes on choice outcomes in organizational purchase settings, there are primarily three relevant research traditions. These are (1) organizational buyer behavior in marketing, (2) small group discussion in communication, and (3) group problem solving in social psychology. Selected contributions from each are reviewed below.

Marketing

One perspective on this subject considers organizational buyer behavior as a special case of individual buyer behavior, constrained by organizational policies, structure, goals, etc. Following this line of reasoning leads one to begin with individual behavior models and adapt them to organizational environments through inclusion or deletion of variables and relationships.[1] In fact, the Sheth[2] model of industrial buyer behavior is one such adaptation, being derived from the Howard-Sheth[3] individual model.

Another approach begins with a recognition of organizational buying as a separate and distinct focal area with a requirement for unique conceptualizations. One then proceeds to develop models that are contextually relevant from the very outset.

Which viewpoint one adopts obviously impacts on both substance and procedure in research. Ultimately the issue revolves around one's locus of interest and philosophical bent. That is, one can concentrate on individual behavior with little to moderate emphasis on organization necessitated modifications, or one can treat the individual as merely

one component in the larger, and more interesting, organizational system.

Just as clearly, the dichotomy presented above does not exhaust the range of research approaches, and in fact the fundamental viewpoint adopted in this research is that it is the interaction of individual and organizational factors that provides the most fertile research ground.

The following paragraphs highlight that research most relevant to a small group decision-making perspective on organizational buyer behavior with a special view to integration of individual and organizational influences.

Although not behaviorally oriented, Industrial Buying and Creative Marketing[4] is widely recognized as a seminal work on industrial buying practices. In it, Robinson, Faris and Wind developed the Buygrid Model which characterizes stages in the purchasing process according to type of purchasing situation. The eight process stages are termed Buy Phases while the three purchasing situations are called Buy Classes. The Buygrid Model appears in Figure 1.

The Buygrid provides a framework for organization of thinking about who would likely be involved, which sources of information and evaluative criteria are most relevant and when various topics are taken up, for each Buy Phase-Buy Class combination. For example, a firm in a new task situation that is seeking to determine the characteristics of a needed item is quite likely to involve several members of various departments in the deliberations. Many different sources of information would be consulted and competing vendors should enjoy relatively easy access to members of the customer firm.

This situation can be contrasted with supplier selection in a straight rebuy situation in which the procedure has been routinized to the point where normal vendor-customer contacts are made computer to

	BUY CLASSES		
	New Task	Modified Rebuy	Straight Rebuy
1. Anticipation or recognition of a problem (need) and a general solution			
2. Determination of characteristics and quantity of needed item			
3. Description of characteristics and quantity of needed item			
4. Search for and qualification of potential sources			
5. Acquisition and analysis of proposals			
6. Evaluation of proposals and selection of supplier(s)			
7. Selection of an order routine			
8. Performance of feedback and evaluation			

FIGURE 1 — THE BUY-GRID MODEL

computer via an automated restocking plan. In this case new vendors are actively discouraged unless serious problems arise with the present arrangement.

Arising simultaneously with the recognition that there existed no such thing as a typical industrial buy, was an awareness that neither was there a typical industrial purchaser. In fact, it had long been known that frequently several individuals cooperated and each either consciously or unconsciously played a certain role in the process. This awareness led to the development of the first of the major orientations to be taken up, namely role theory.

A role is typically conceived as a set of norms which guide individual activity with respect to persons, objects, etc., in social environments. The fundamental constructs around which research is organized include role perceptions or expectations, role enactment and role conflict.[5] An individual enacting the role, let's say, of organizational buyer harbors certain expectations regarding the manner in which he should perform his duties. Some of these expectations are the direct result of the formal norms that constitute his job description. Others, less rigid, yet extremely important, arise out of the individual's perceptions of what it takes to succeed, or at least remain in his particular organizational unit. Theoretically the person then acts in a way consistent with these expectations. Often, as a result of simultaneous enactment of multiple roles, the person is thought to experience role conflict when the demands of the various roles are at variance with one another. He then must resolve that conflict in some fashion, commonly by acting in accordance with the norms attached to the more salient role.

The single most influential role theory approach to organizational

buyer behavior is that proposed by Webster and Wind.[6] They developed the concept of the buying center and described the roles of the individuals occupying that center. The buying center can be thought of as all those members of the organization who interact with each other during the buying decision process. The principal feature of this concept is that the buying center is the locus of decision-making authority and its boundaries usually cut across formal structural or departmental lines. Membership in the center is dynamic and will shift across stages in the decision process and characteristics of a given buy.

Each member of the buying center enacts one or more of the following roles: user, influencer, buyer, decider, or gatekeeper.[7] Users are those individuals who will actually utilize the equipment, material or component part under consideration. They often initiate requests for specification changes and are most often concerned with operational product features. Users may exert influence singly or in combination and commonly are consulted about the performance of existing equipment as one source of information in establishing qualifying criteria.

Influencers are any members of the organization who directly or indirectly influence purchase or usage decisions. Influencers may act purposefully out of a vested interest in choice outcomes or may not even be aware of their influence potential. This latter case occurs when, for example, one department head observes the requisitioning behavior of another, whom he desires to emulate, and so patterns his requisitions accordingly.

Buyers are those members of the center who are charged with the formal authority for vendor selection and purchase negotiation. They typically occupy the position of buyer or purchasing agent in functionally specialized industrial firms, or may be members of a formal

buying committee in reseller firms. The buyer's influence is felt most strongly in the areas of establishing financial criteria and coming to the actual terms of sale. Also the buyer may act to limit the range of qualifiable vendors based on other criteria, for example, logistical capabilities or past customer service record.

Deciders are those who, through the use of either formal or informal power, actually decide what will be bought and from whom. Deciders may come from various activity areas, and it is for this reason that researchers frequently study buyers rather than deciders--the decider being very difficult to identify.[8] It is not uncommon for decision authority to be split, i.e., one person or group decides the specifications to be used in vendor qualification and another chooses from among the qualified vendors.

Gatekeepers are any and all individuals who control the flow of information into and out of the buying center. Gatekeepers play a critical role from the marketer's point of view, since they may act to prevent salesman contact with certain individuals or fail to pass along key information to deciders or others.

The buying decision process then is the product of a complex set of social relationships among members of the buying center, whose behaviors are at least partially prescribed by the norms associated with these roles. In a recent study[9] among purchasing and non-purchasing executives of manufacturing concerns in Cleveland, Ohio, it was found that role-related perceptual differences were significant in 16 of 65 vendor selection attributes investigated. These perceptual differences are suggested as a source of conflict among members of the buying center. A similar study[10] involving firms purchasing chemical intermediates demonstrated that role-related perceptual differences extend to the

actual members of the buying center as well. That is, the perceptions of purchasing agents, management and technical specialists regarding their relative influence on and responsibility for vendor choices were found to be significantly different.

More specifically, when the component stages in the procurement process are examined individually, a descriptive study[11] involving 76 representatives of 15 Columbus, Ohio, machinery manufacturers suggested that, for example, a far lower percentage of top managers than purchasing agents expect functional managers to be responsible for establishing specifications and determining the amount to be purchased. However, there was general consensus that purchasing agents should select suppliers and conduct post-purchase appraisals.

An obvious failing of published role-related research lies in the narrow way in which roles have been conceived. Only the easily definable roles provided by job description or title have been used. Neither the perceptual nor behavioral differences suggested by the Webster and Wind taxonomy have been investigated. A potential solution to this problem has been suggested by Calder[12] who advocates use of a technique called structural role analysis to integrate individual and organizational determinants of the decision process.

When considering organizational buying from a small group perspective additional role concepts are needed, specifically that of group leader. Norms and behaviors associated with leadership roles are considered in the following section.

Leadership in a small group may be obtained, principally, in either of two ways; it may be conferred by the group members out of respect or deference, or it may be appointed through formal organizational rules. The concepts of leadership and power are closely interwoven. Those who

lead have power, and those who have power influence decision outcomes.

According to a widely employed typology[13] there exist fives bases of social power, namely expert, coercive, reward, referent and legitimate. Briefly, expert power accrues to those having greater knowledge or comprehension of task relevant information, coercive power results from an ability to force compliance through threat of sanction, reward power comes with ability to provide desired reinforcements, referent power is the product of one person's desire to emulate or be similar to another and finally, legitimate power is the outgrowth of formalized norms indicating that compliance is expected.

Traditionally, legitimate power receives the most attention as it results from the formal organizational hierarchy and is therefore most visible. In this case "leader" is synonymous with manager or supervisor and the salient role expectations revolve around providing direction, choosing among alternatives, and implementing planned for activities. It is only more recently that students of organizational buying have pursued other power-related approaches in their attempts to identify and characterize decision makers in various environments.

In a review article probing the question of the mechanisms by which members of a buying center reach joint decisions, Bagozzi[14] highlights two of the newer approaches. The first, termed Social Judgment Theory, is a model developed to consider human judgment processes in situations involving two or more persons. It is most appropriate in those circumstances in which cognitive conflicts exist among the group members. The type of conflict studied is rather narrowly defined to include only that resulting from differences in models applied to solution of particular problems. These model differences commonly center around the form of the function relating stimulus cues to judgments, cue

weighting strategies, information integration rules, etc.

Subjects are required to study a stimulus array of some sort, make an individual judgment, discuss the problem with each other, and finally, arrive at a joint decision. Measurements are usually taken on several dependent variables including individual and joint problem solutions and pre- and post-discussion peer evaluations.

Empirical research based on the SJT model can be summarized as follows:

- subjects do not resolve or change their initial overt judgmental differences
- subjects do however alter the models upon which the judgments depend or act in a fashion inconsistent with the original model
- changes in judgment models result from social interaction in the discussion phase.

The second is a utility-degree of control model of social action developed by Coleman.[15] Operationalization of the model requires gathering data on the degree of control each actor has on the events associated with the collective decision and the level of interest each actor has on the outcomes of those events. When both sets of data are cast in matrix form, one is able to determine:

- the value of each event
- the overall power of each actor
- the outcome of each event.

Of particular interest is the ability of the model to specify the extent to which actors have power over each other. This is done by relating various actors' levels of interest in a particular event to their respective degree of control over that same event.

Applications of this model are limited in scope and number as it

presumes ability to accurately measure the degree of control over and interest in "events." In addition it rests upon the economic assumption that each actor is motivated by a desire to maximize control over these events of interest.

Yet a third power-related conceptualization of organizational buyer behavior processes is suggested by Zaltman and Bonoma.[16] It is called the Locus of Influence Grid. The grid consists of a four-celled matrix, reproduced in Figure 2, which isolates both internal and external sources of influence at both the department and corporate levels. This approach suggests areas appropriate for investigation; however, it does not stipulate specific research hypotheses and as yet has not been utilized in published empirical work. In describing the grid the authors note that the bulk of organizational buyer behavior research has focused on areas relevant only to the first cell.

The concept of power is of central interest to students of organizational buying. To date most discussions of power have been directed toward identifying those who have power over particular decisions and specifying how that power is acquired.* The present research also considers the role of power in group purchase decisions, however, in a more narrowly defined way.

Specifically, to what extent does the sales representative have an opportunity to influence the amount of expert power held by one or more members of the buying center through control of distribution of task relevant information? Rather than attempt to measure power directly, the research approach is to measure the consequences of unequal power

---

*The supposition being that once the mechanisms of power acquisition are uncovered we will be better able to predict who will have power in future choice situations.

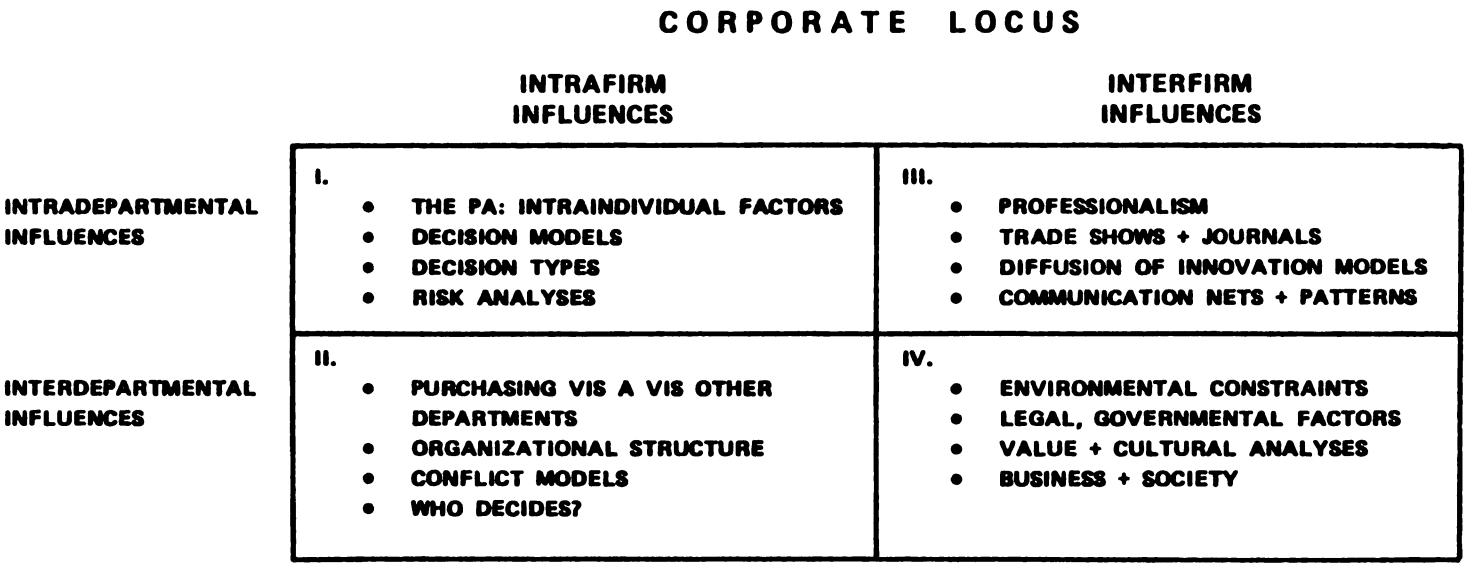


FIGURE 2 – THE LOCUS OF INFLUENCE MATRIX

distribution as manifested by leadership and directiveness in group discussions.

Thus far attention has been devoted to the use of two constructs, roles and power, in models of and research on organizational buying. A third concept, perceived risk, is now considered to conclude the marketing portion of the literature review.

It has been suggested that consumers seek out purchase-relevant information and develop brand loyalties in response to a need to reduce the amount of perceived risk associated with a particular purchase. Application of the perceived risk construct to individual consumer behavior was pioneered by Bauer[17] and Cox.[18]

Adapting their work to organizational buying, Hakansson and Wootz[19] developed the following perceived risk model:

$$\text{Purchasing Behavior} = f_1 \text{ (perceived risk)} = f_2(S_i D_j E_k) \quad \{1\}$$

and,

$$S_i = f_3(U_i V_i) \quad \{2\}$$

where, S_i = characteristics of the buying situation, i,

D_j = characteristics of the decision maker, j,

E_k = characteristics of the decision environment in firm k,

U_i = amount of uncertainty in situation, i,

V_i = value of consequences of the decision in situation, i.

Using this model as a guide to variable specification they performed an experiment involving 43 purchasing agents in 3 Swedish firms. The subjects were asked to indicate vendor preferences under conditions manipulated to produce high and low perceived risk. It was hypothesized that purchasers generally prefer local to distant suppliers and that interactions exist between level of perceived risk and:

- preference for large suppliers
- emphasis placed on the quality dimension

- number of bids solicited.

The results indicated support for the main effects and interactions as influencing vendor selection save the last interaction. Their findings are somewhat suspect however as the distance variable is confounded with country of origin, i.e., all of the close-in suppliers are Swedish while all of those distant are also foreign.

In another experimental investigation involving perceived risk, Cardozo and Cagley[20] postulated that preference for well-known firms over unfamiliar firms would be higher in high-risk than low-risk situations. In addition, purchasers would also prefer high informational content ads and solicit more bids in high perceived risk situations.

These hypotheses were tested via a laboratory buying game with 64 industrial purchasing agents as participants. Each subject was exposed to a series of eight, short written cases, each presenting a different buying situation. Level of risk was manipulated through changes in attributed price and late delivery sensitivity. All three hypotheses were supported at the ($p<.05$) level.

Grønhaug,[21] writing on the determinants of joint vs. autonomous decisions in organizational buying, developed the following model:

$$D = f(N,P,R) \qquad \{3\}$$

where, D = type of decision (autonomous or joint)

N = degree of routinaization of buying problem

P = perceived product importance

R = resources available for handling buying problems.

Comparing the independent variables in this model with those in equation {1} above it is evident that perceived risk has an impact on the number of participants in the decision-making process. In general,

the greater the perceived risk the greater the likelihood that the decision will be made jointly.

Perceived risk has also been related to self-confidence, both generalized and specific. Dash et.al.,[22] following an examination of consumer store choice mechanisms, conclude that self-confidence is functionally inverse to perceived risk. The impliaction being that any factor having a risk-reducing effect should be confidence enhancing.

In the present research this proposition is tested by means of a pre-discussion check of self-confidence levels. Individuals who receive more information regarding choice alternatives should report higher confidence than those receiving less information.

Examination of the findings cited above might easily lead one to draw the conclusion that considerable progress has been made in identifying variables and specifying relationships causally related to organizational purchase outcomes. And indeed this is true if discussion is limited to autonomous decisions. However, many of these studies have been criticized on the grounds that they do not capture the dynamics of the joint decision process. As long as the individual purchasing agent remains both unit and level of analysis this criticism is no doubt well founded.

There exists a widely recognized[23] need to move away from the individual to the group as the appropriate level of analysis. To date marketing researchers have generally not been successful in their attempts to cope with multi-person decisions. Neither theoretical background nor measurement instruments have been well suited to study of the complex dynamics of group decision making. This problem is now receiving greater attention and some[24] have presented approaches more amenable to group-level analysis.

Turning from the marketing literature to that in communication and social psychology, one finds a wealth of information that is conceptually if not contextually relevant. Selections from each of these disciplines highlighting a process approach to small-group decision making are reviewed in the following paragraphs.

Communication

Communication theorists interested in small group processes have attempted to describe those characteristics of sources, message content, message channels and receivers that either facilitate or inhibit communications flows. Typical of the independent variables studied in this context are:

- group size
- group composition
- member roles and status
- norm formation, conformity and cohesion
- communication network or pattern
- information distribution.

While dependent variables might commonly include:

- decision quality
- decision speed
- cohesion and member satisfaction
- group effectiveness and performance.

The focus in the present work is on establishing relationships between factors antecedent to verbal advocacy in discussion, the perceived presence and intensity of that advocacy behavior, and the influence of that advocacy on decision choices and other outcomes; therefore, only studies relevant to this purpose are considered.

Over the previous two decades it appears that a consensus has been reached concerning the relationship between talkativeness and decision outcomes. Hoffman,[25] reporting on a study following up earlier work by Thomas and Fink,[26] concluded that the most talkative group members were most successful in influencing decision outcomes. Furthermore, it was found that the solution receiving the highest number of favorable comments most often was adopted by the group and that most of these favorable comments frequently came from a single group member. The discussion goes on to suggest that in groups faced with complex problems, people were willing to rely on those who sound as if they know the answer.

In a more recent study, Bishop and Myers[27] experimentally manipulated the conditions of discussion along an activity dimension with the result that exchange of arguments during active discussion produced greater attitudinal change among group members than did passive exposure to these same arguments. Clearly, choice outcomes are a function of both quantity and quality of participation.

Amount and type of discussion activity has also been related to leadership. A citation by McGrath and Altman notes that:

> Although appointed and emergent leaders displayed equal over-all leadership ability they were differentiated by specific behaviors. Appointed leaders more frequently asked for opinions and desired and initiated action than did other group members, whereas emergent leaders proposed more courses of action and were more active in general than were other group members. Both appointed and emergent leaders were differentiated from the other subjects by more frequently diagnosing the situation and giving action information to groups.[28]

The type of communication network found in a face-to-face group is termed a comcon, or all-channel network. It is characterized by complete freedom of access among members. The extent to which one member

has access to or communicates directly with other members is measured by centrality, which is the fraction of persons in a group a person actually communicates with out of the total number in the group. In a comcon centrality scores are equal across members, which means that none has any structural advantage over any other in terms of ability to influence outcomes. What other factors then do influence an individual's ability and willingness to participate actively in a decision-making discussion? Moreover, which of these factors are themselves influenceable by external agents, for example, vendor sales representatives?

The relationship between power and communicative activity is fundamental and clearcut. Power and status are strongly linked to communicative activity in those persons having these attributes, and the presence of these persons strongly inhibits activity by others. Collins and Guetzkow report,

> The tendency for high power-status persons to initiate more communication is one of the most powerful and reliable phenomena summarized in this book. The relationship is reported in a wide variety of groups.[29]

Bales et.al.,[30] state that there is a tendency for a few people to dominate a discussion and that this tendency increases with increasing group size. Patton and Giffin[31] note that high-status members participate more, that these high-status persons tend to be task leaders, and that the content of their communication is to give ideas and provide guidance. Finally, Fisher provides a useful summary when he comments that,

> Certainly the status of the group member affects the messages he initiates and receives. Who says it is as important to perceiving the relative importance of the message as what is said.[32]

Fisher also notes that initially the bulk of communication is between

emerging leaders and their lieutenants but that over time differing positions are advocated by the leaders with lieutenants restricted to playing supporting roles.

The question then becomes, "What can a vendor do to influence the power and status of one or more of the group members?" Must the vendor representatives endeavor to identify the most powerful member(s) or can they successfully alter, to some extent, existing power-status relationships?

Referring again to the French and Raven[33] power typology, the one source of power most readily influenceable by a vendor is knowledge or expert power. It has been shown that sole possession of task-relevant information confers higher status and that this sole possessor experiences higher job satisfaction.[34] Collins and Guetzkow,[35] discussing problems in which the solution is not obvious to the group members, report that the sole possessor of task-relevant information was rated higher by the other group members on two measures of participation: (1) number of contributions made and (2) overall quality of contribution to the decision.

This finding is confounded when that person is the sole possessor of information about several competing alternatives.

> The informed member does not make use of six units of information in the same way he does two units. With two units he tended to mention both possible solutions, but selected one of these to try and sell to the group. With six units he tended to mention all six suggested solutions, but did not give the impression of being committed to one in particular.[36]

Another facet of the relationship between information distribution and group process is revealed in a study by Shaw[37] which indicated that possession of information, per se, does not guarantee its use. A moderating factor is the degree of confidence the individual has that

the information is both truly applicable and correct. Thus, the individual's perceptions of information relevance and source credibility will, to some extent, determine if, when and how that information will be utilized. Inasmuch as mode of information presentation, i.e., active vs. passive, has already been discussed relative to amount of influence on decision outcomes, these latter findings are especially noteworthy.

Finally, language intensity or strength of claim has been suggested as a determinant of success in persuasive communication attempts. That is, the strength of a claim may be represented as a distance from a neutral point. Burgoon and Ruffner[38] point out that language intensity may be manipulated through the use of qualifying adjectives along the dimensions of probability or extremity.

In addition, language intensity can be varied through the use of metaphors, for example, "Our copier out distances the competition." The influence of strength of claim on persuasiveness has not been clearly established. In an often-cited study, McEwen and Greenberg[39] note that communicators employing more intense language are perceived as being more credible and their messages seem clearer and more intelligent. However, Burgoon and Stewart[40] report that this effect may be moderated by other variables, e.g., sex. They found that receiver ratings of male sources of relatively intense messages were higher than those for females in the same situation.

In view of the ambiguity concerning it, strength of claim is included as an independent variable in the research design.

Summarizing this section, it is evident that one avenue a vendor may choose in attempting to influence group processes is to single out a group member and provide that member with task-relevant information not previously available to the others. Secondly, it would appear that

willingness of the recipient to use this information in the form of active participation and advocacy of a particular product or brand also depends on the amount of confidence held in that information.

Following the line of reasoning that links confidence level to perceived credibility of message source suggests that the strategy outlined above should be more successful when applied by a high credibility source than a low credibility source. This in turn has implications for its value to in vs. out suppliers, those with readily recognized brand names and respected corporate images, etc.

Lastly, it would appear that a relationship may exist between strength of claim made in a persuasive message and both perceived source credibility and decision outcome. While neither direction nor magnitude of influence have been plainly established, the construct has sufficient relevance to the current situation to warrant further investigation.

Social Psychology

To a great extent all of the research findings considered thus far are social psychological in nature, differing only in application or perspective. For this reason, the contributions cited below are drawn from a narrowly specified and recently developed research tradition, namely choice shift theory.

Choice shifts are changes in group members' attitudes and/or risk averseness resulting from group discussion. Interest in the area has grown steadily following the 1962 findings by Wallach, Kogan and Bem[41] that mean pre-, post-discussion group scores often shifted in a more risk prone direction. The effect was named the risky shift and several researchers set about the task of uncovering mechanism(s) that would

explain the shift. Among the leading contenders were diffusion of responsibility, enhanced value salience, normative compliance and informational influence. Each is considered in turn below, but suffice it to say the weight of evidence now supports the information integration-influence school of thought.

Later, the same effect was demonstrated along non-risk dimensions, e.g., attitudes concerning people, issues, etc., and so the term choice shift has largely come to replace risky shift. While the primary aim of this dissertation is neither to demonstrate existence of nor elaborate on causes of choice shifts, the subject is highly relevant, since choice shift researchers have been probing group decision-making processes, the understanding of which is vital to the current purpose. In addition, this research incorporates a slightly modified version of a now-standardized experimental procedure adopted by choice shift students.

Early explanations of choice shifts have been thoroughly reviewed by Vinokur,[42] and the following section draws heavily on that review.

Four distinct approaches have emerged, these being affective, cognitive, interactive and statistical. When an individual tempers activity based upon the perceived social consequences of that activity an affective process is at work. There are principally two affective hypotheses, diffusion of responsibility and risk as a value.

Proponents of diffusion of responsibility contend that group members take more extreme positions acting as group members than they would as individuals since the negative consequences of failure are spread across several people. However, an opposing hypothesis is also compatible with available research data, namely that individuals in groups push the group to more risky choices so that they may later claim the rewards for having led the group to the correct decision.

The risk-as-a-value hypothesis suggests that acceptance of risk is a socially valued norm in current United States society and therefore operates to bias informational contents arising from discussion and leads individuals to attempt to outdo each other in expressing risk tolerance, permitting these individuals to demonstrate proximity to a cultural ideal. While many studies purport to validate the risk-as-value hypothesis the results appear "eqivocal" (in Vinokur's words) and shifts have been recorded under conditions lacking the normative feedback critical to risk as a value.

Cognitive hypotheses have as a central tenet the idea that individuals exhibit pre-, post-discussion choice shifts as a result of exposure to previously unconsidered task relevant information, the integration of which through perceptual processes results in attitude/preference change. Using the behavioral decision theory approach, the individual is thought to act in such a way as to maximize subjected expected utility attributible to decision outcomes. Inasmuch as the cognitive approach to choice shifts is incorporated in the proposed process model of group organizational buying, further discussion is reserved for succeeding paragraphs.

Interactive hypotheses stress the role of interpersonal processes in producing choice shifts. They seek to establish sources and mechanisms of social influence and relate these to decision outcomes. Perhaps two of the more widely recognized of the interactive hypotheses are the risky leader approach and influential extremist approach.

The risky leader is a trait theory approach suggesting that risk acceptance is a stable personality factor linked to leadership ability and propensity to lead. The risky leader theory has largely been rejected owing to an inability to demonstrate consistent patterns of

relationship between sets of personality traits and demonstrated leadership. On the other hand, the supposition that some individuals in a group are more influential for having taken an extreme position is supported by what is known regarding public commitment.

That is, individuals required to publicly express an opinion have, in some studies, proven more resistant to later counterattitudinal influence attempts than those who did not. Further evidence suggests that those persons initially taking more extreme positions are more likely to be privately committed and more confident in themselves as well. These extremity influence, also termed polarity, models have in fact been reported as yielding better predictive accuracy with respect to exact group decisions than any other model yet proposed.[43]

Finally, statistical hypotheses view choice shifts as artifactual being the result only of the initial distribution of member positions and the particular decision rule employed. Chief among these is the majority rule hypothesis which predicts a shift in the direction of the mean pre-discussion position. Considerable evidence is cited supporting a majority rule position[44] and it has received attention in consumer-oriented situations as well.[45]

Over and above whatever supporting evidence exists from experimental social psychological studies, the cognitive approach should have intuitive appeal to marketers. As chief proponents of this school, Vinokur and Burnstein,[46] building from an expected utility model, suggest that persuasive argumentation during discussion is the primary mode of group choice. Further, there exists for each alternative a pool of persuasive arguments favoring its adoption. The total impact of a given pool of arguments on the choice process, especially the production of shifts, is a function of two variables, the inherent

persuasiveness of each element in the pool and its diffusion potential. Diffusion potential can be measured as a fractional index, taking on the value 1 when all group members initially are aware of an argument and the value 0 when none are.

Assuming equal inter-pool persuasiveness scores, i.e., neither vendor enjoying preponderant economic or performance advantage, arguments introduced in the course of discussion, which are new to some members, should produce greater impact than introduction of arguments already known to all group members. Thus it is the cognitive integration of new information by group members that is the primary influencer of the process, not a desire by group members to diffuse responsibility or simply to appear more extreme for its own sake. Vinokur and Burstein contend that it is this partial sharing of arguments, that is, being known to some but not others, that enhances their impact in discussion.

Following this line of reasoning suggests that efforts to unbalance distribution of information, hence arguments, may prove fruitful in influencing group choice processes.

To summarize, evidence has been presented in this chapter demonstrating the need for group focused research in organizational buying. Furthermore, research findings cited suggest a mechanism of group process. Chapter III next presents the development of a causal model based on the findings discussed above and presents the hypotheses used to test the model.

REFERENCES

1. Feldman, W. and R. N. Cardozo, "Industrial Buying as Consumer Behavior," in Proceedings, Chicago: American Marketing Association (Summer 1976).

2. Sheth, Jadish, "A Model of Industrial Buyer Behavior." Journal of Marketing, 37, (October 1973), 50-6.

3. Howard, John A. and J. Sheth, The Theory of Buyer Behavior, New York: John Wiley & Sons (1969).

4. Robinson, P. J., Charles W. Faris and Yoram Wind, Industrial Buying and Creative Marketing, Boston: Allyn & Bacon (1967).

5. A more detailed discussion of these constructs may be found in Lyman E. Ostlund, "Role Theory and Group Dynamics," in Consumer Behavior: Theoretical Sources, Scott Ward and Thomas Robertson (eds.), Englewood Cliffs, N.J.: Prentice-Hall Inc. (1973), 231-75.

6. Webster, F. E. and Y. Wind, Organizational Buying Behavior, Englewood Cliffs, N.J.: Prentice-Hall Inc. (1972).

7. Ibid., 77-80.

8. Weigand, Robert E., "Identifying Industrial Buying Responsibility." Journal of Marketing Research, 3 (February 1966), 81-84.

9. Kiser, G. E., C. P. Rao and S. R. G. Rao, "Vendor Attribute Evaluations of 'Buying Center' Members Other Than Purchasing Executives." Industrial Marketing Management, 4 (1975), 45-54.

10. McMillan, James R., "Role Differentiation in Industrial Buying Decisions," in Combined Proceedings, T. V. Greer (ed.), Chicago: American Marketing Association (1973), 207-11.

11. Gorman, Ronald M., "Role Conception and Purchasing Behavior." Journal of Purchasing and Material Management, (February 1971), 57-71.

12. Calder, Bobby J., "A Methodology for Research on Organizational Buyer Behavior," in Organizational Buying Behavior, T. V. Bonoma and Gerald Zaltman (eds.), Chicago: American Marketing Association (1978), 77-83.

13. French, John and Bertram Raven, "The Bases of Social Power," in Studies in Social Power, Dorwin Cartright (ed.), Ann Arbor, University of Michigan, Institute for Social Research (1959), 150-67.

14. Bagozzi, Richard P., "Exchange and Decision Processes in the Buying Center," in Bonoma and Zaltman, op.cit., 100-125.

15. Coleman, James S., The Mathematics of Collective Action, Chicago: Aldine Press, (1973).

16. Zaltman, Gerald and Thomas V. Bonoma, "Organizational Buying Behavior: Hypotheses and Directions." Industrial Marketing Management, 6, (1977), 53-60.

17. Bauer, Raymond A., "Consumer Behavior as Risk Taking," in R. S. Hancock (ed.), Chicago: American Marketing Association (1960), 389-98.

18. Cox, Donald F., Risk Taking and Information Handling in Consumer Behavior. Boston: Harvard University (1967).

19. Hakansson, Hakan and Bjorn Wootz, "Supplier Selection in an International Environment: An Experimental Study." Journal of Marketing Research, 12, (February 1975), 46-51.

20. Cardozo, Richard N. and James W. Cagley, "Experimental Study of Industrial Buyer Behavior." Journal of Marketing Research, 8, (August 1971), 329-34.

21. Grønhaug, Kjell, "Autonomous vs. Joint Decisions in Organizational Buying." Industrial Marketing Management, 4, (1975), 265-71.

22. Dash, Joseph F., Leon G. Schiffman and Conrad Berenson, "Risk and Personality-Related Dimensions of Store Choice." Journal of Marketing, 40, (January 1976), 32-9.

23. See for example, David T. Wilson, "Research Approaches to Multi-Participant Decision Processes." Advances in Consumer Research, 5, (1978), 641.

24. Spekman, Robert E. and Bobby J. Calder, "Narrowing the Conceptual-Empirical Gap in Organizational Buying Behavior." Ibid., 653-6.

25. Hoffman, L. R. "Group Problem Solving," in Advances in Experimental Social Psychology, L. Berkowitz (ed.), v.2, New York: Academic Press, (1965), 105.

26. Thomas, E. J. and C. F. Fink, "Models of Group Problem Solving," Journal of Abnormal Social Psychology, 63, (1961), 53-63.

27. Bishop, G. D. and D. G. Myers, "Informational Influence in Group Discussion." Organizational Behavior and Human Performance, 12, (1974), 92-104.

28. McGrath, J. E. and I. Altman, Small Group Research: A Synthesis and Critique of the Field, New York: Holt, Rinehart and Winston Inc., (1966), 229.

29. Collins, B. and H. Guetzkow, A Social Psychology of Group Processes for Decision Making, New York: John Wiley and Sons (1964), 155.

30. Bales, R., F. L. Strodtbeck, T. M. Mills and M. E. Roseborough, "Channels of Communication in Small Groups." American Sociological Review, 16, (1951), 461-68.

31. Patton, B. R. and K. Giffin, Problem-Solving Group Interaction, New York: Harper and Row (1973), 105.

32. Fisher, B. A., Small Group Decision Making: Communication and the Group Process, New York: McGraw-Hill Book Co. (1974), 166.

33. French, John and Bertram Raven, op.cit.

34. Kelley, H. H. and John Thibaut, "Group Problem Solving," in The Handbook of Social Psychology, Gardner Lindzey and Elliot Aronson (eds.), v.4, Reading, Massachusetts: Addison-Wesley Publishing Co. (1969), 19.

35. Collins, B. and H. Guetzkow, op.cit., 29.

36. Ibid., 77.

37. Shaw, M. E. "Some Factors Influencing the Use of Information in Small Groups." Psychological Reporter, 8, (1961), 197.

38. Burgoon, M. and M. Ruffner, Human Communication, New York: Holt, Rinehart and Winston (1978), 416.

39. McEwen, W. J. and B. S. Greenberg, "The Effects of Message Intensity on Receiver Evaluation of Source, Message and Topic." Journal of Communication, 20 (1970), 340-350.

40. Burgoon, M. and D. Stewart. "Empirical Investigations of Language Intensity: I. The Effects of Sex Source, Receiver and Language Intensity on Attitude Change." Human Communication Research, 1, (1975), 244-8.

41. Wallach, M. A., N. Kogan and D. J. Bem, "Group Influence on Individual Risk Taking." Journal of Abnormal and Social Psychology, 65, (1962), 76-86.

42. Vinokur, Amiram, "Review and Theoretical Analysis of the Effects of Group Processes Upon Individual and Group Decisions Involving Risk." Psychological Bulletin, 76, (1971), 231-50.

43. Ibid., 240.

44. Ibid., 242.

45. Reingen, P. H., "The Risky Shift in Ad Hoc and Natural Consumer Groups: A Test of the Polarization Hypothesis and a Majority-Rule Explanation." Advances in Consumer Research, 5, (1978), 87-92.

46. Vinokur, A. and Eugene Burnstein, "Effects of Partially Shared Persuasive Arguments on Group Induced Shifts: A Group Problem-Solving Approach." Journal of Personality and Social Psychology, 29, (1974), 305-15.

Chapter III

A CAUSAL MODEL

Model Development

Models are defined as any symbolic representation of reality and may be classed according to type, purpose and characteristics. For example, a model may be verbal, mathematical or iconic. Along another dimension it may be static or dynamic and yet a third factor is a micro vs. a macro orientation. A model may be developed primarily for descriptive, predictive or normative purposes.

Modeling is vitally important to all scientists, and most especially to social scientists. Students of human behavior are unable to directly examine the workings of cognitive and affective processes, and so must presume causal factors and mechanisms of action. In general theirs are termed "black-box" models recognizing one's inability to do more than make inferences.

Models perform many useful functions. They assist the researcher in organizing his thinking while to some extent forcing him to make explicit that which was previously implicit. When made public in some manner they perform a valuable communication role, as a good model efficiently conveys much information to a knowledgeable reader. Nonetheless, announcement of a new model is not universally received with pleasure. Despite many benefits, proliferation of new models may serve to hinder rather than facilitate understanding. Critics complain that behavioral scientists now suffer from line and box verbosity not unlike political rhetoric.

Such criticisms are well founded when researchers invent and create

with little regard for what has gone before. Perhaps even more serious, descriptive models are often presented and subsequently abandoned by their progenitors. After a period of benign neglect, and numerous citations, they may take on an unwarranted air of veracity. Discussing a regression approach to modeling individual organizational buyers' attribute weighting processes, Scott and Wright[1] review 23 studies reporting on models of cue weighting. While a goodness of fit in estimation sample measure of predictive validity was found in 21 studies, only 10 attempted cross-validation and two, less than 10 percent, attempted a measure of convergent validity by comparing estimated regression weights with those predicted by prior theory.

Clearly there exists a need in marketing to develop new models, to test models already available and to perform purely descriptive research. Yet modeling is of paramount importance. Considering the state of industrial buyer behavior modeling in 1969, Webster[2] concluded that its principle shortcomings were that overall, few studies had been undertaken and that those that had were very much independent of one another, difficult to replicate and lacking in scientific orientation. It would appear that by now several of these deficiencies have been overcome. Numerous studies dealing with organizational buying have been conducted and, as Ferguson comments reviewing the situation as of 1978:

> The current literature indicates that most of the studies of industrial buyer behavior conform to the criteria for scientific research in that hypotheses are established, data collection procedures defined, and a basis for accepting or rejecting hypotheses is identified.[3]

Also, there now exist two well-established comprehensive models of organizational buying and numerous micro-models of specific elements. The situation is succinctly described by Wilson observing that:

> Examination of all of these comprehensive models shows that they are composed of essentially the same basic elements: environmental, task or situational, organizational, individual and social factors. There may be some semantic or organizational differences between the models but they all recognize the complex set of interactions that constitutes organizational buyer behavior. It would appear that the need is not for more comprehensive models, but rather empirical tests of the elements of the grand models that now exist.[4] (Emphasis added)

Examples of the type of approach advocated by Wilson are found in studies by Grønhaug[5] and Lambert et.al.,[6] in each the Sheth model, Figure 3, served as a framework.

Grønhaug has developed a risk-resources model, described earlier, to determine whether a given decision were more likely to be made autonomously or jointly. Employing a multiple discriminant function model on a sample of buyers for retail stores in Norway, 77.5 percent of the cases were correctly classified as joint or autonomous while correct classification of 58 percent of the cases could have been expected on a chance basis alone.[7]

Lambert et.al., employed a paper and pencil buying game experiment to test effects of post-choice evaluatory feedback on attitudes toward both chosen and not chosen alternatives. Subjects were presented with a hypothetical purchase situation, asked to make a choice, then received either supportive or critical reinforcement. Their research was designed to amplify the relationship between what Sheth labels supplier or brand choice and satisfaction with purchase which in turn impacts on future expectations.

The approach followed by Grønhaug, Lambert et.al. and here is somewhat akin to that of the engineer who first draws blueprints and specifications for a complete piece of equipment and subsequently provides an "exploded view" of individual components. The model described in this

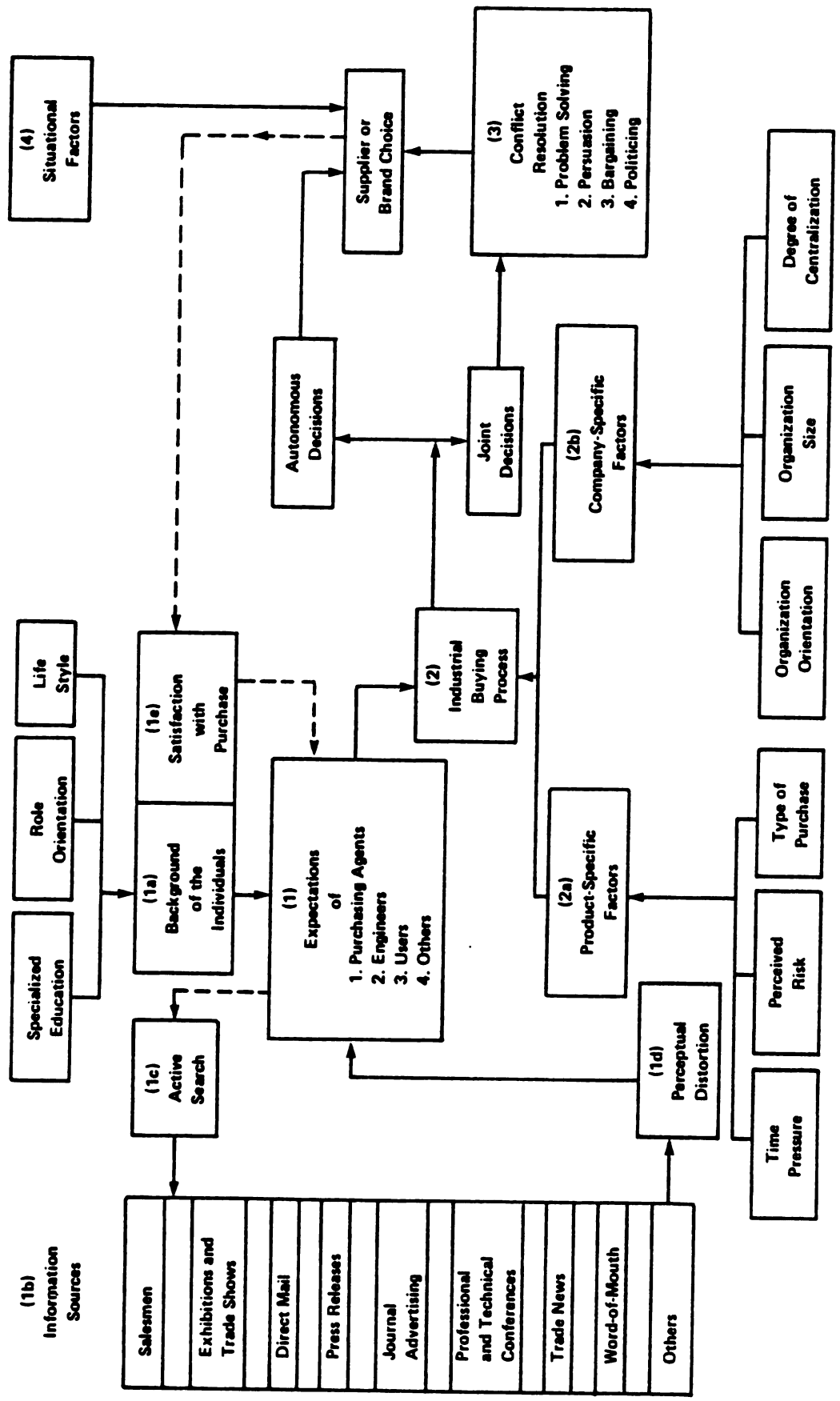


FIGURE 3 – THE SHETH INDUSTRIAL BUYER BEHAVIOR MODEL

chapter presents such an exploded or blown-up view of the box labeled Conflict Resolution (3) in the Sheth model.

Before proceeding with a detailed description of the concpetual underpinnings of the model it seems appropriate to comment on the guidelines which shaped it. There exists amongst scientists no small amount of controversy over the "proper" method of theory generation. For example, Glaser and Strauss[8] argue strongly for an inductive approach. Elaborating on what they term the discovery of grounded theory, they pointedly remark that "grand theorizing," while esthetically pleasing at worst and vital at best, does not provide direction and fails to close the gap between pure abstraction and a "multitude of miniscule substantive studies." In fact, they contend that the main goal of the social scientist is to develop new theories in a purposeful systematic fashion "from the data of social research."[9]

That approach has not been adopted here. Rather the new model was grounded in another way. Through careful consideration of previous empirical work, in marketing, buyer behavior and other behavioral sciences, a deductive development process was followed which assures continuity and facilitates integration. The function performed by the inductive approach, namely, assurance of relevance in the sense of external validity, is assumed by the validation procedures described in the following chapter.

In addition, it was felt that the new model should meet several specific criteria, in particular it should:

- Explicitly indicate hypothesized relationships in a way suitable for empirical test,
- Be capable of integration into existing comprehensive models, especially the Sheth model, with a minimum of modification,

- Be amenable to and, in fact, motivate research at the group rather than individual level of analysis.

As mentioned above, the point of departure for the new model is that portion of the Sheth model labeled Conflict Resolution. He notes:

> The most important aspect of the joint decision-making process, however, is the assimilation of information, deliberations on it, and the consequent conflict which most joint decisions entail. According to March and Simon conflict is present when there is a need to decide jointly among a group of people who have, at the same time, different goals and perceptions.[10] (Emphasis added)

Thus the decision-making process is conceptualized as being synonymous with a conflict resolution process. Emphasis on the manner in which this occurs is apparent, yet Sheth's discussion goes no further than to highlight various general types of processes. That is, when conflict results from disagreements over vendors' offerings or criteria used to evaluate those offerings, what are termed "rational" processes, problem solving and persuasion, are likely to be invoked. Behaviors characteristic of these processes are seeking of additional information, consideration of new suppliers, or heightened conformity pressure on deviant members.

On the other hand, when disagreements are more fundamental, when attitudes are more strongly held, or when sources of disagreement are personality or politically based, processes of bargaining and politicking come into play. Here discussions are much more likely to become heated, emotional and punctuated with personal attacks.

One explanation for existence of these conflicts and their characteristic resolution modes, despite supposed common interest in achievement of organizational goals, is disparity among personal goals of group members. Frequently organizational goals are ambiguous, or not immediately relevant to the day-to-day decision-making environment of lower

and middle management personnel. Thus, what is perceived as best for the individual and his department or operational area is often simultaneously perceived as being best for the organization as a whole. Given that individual expectations and attitudes play such an important role in decision-making processes, a question remains as to the nature of mechanisms employed by individuals, in the context of a particular organization and situational environment, in assimilating and subsequently using information.

Insight into these mechanisms is provided by first considering a generalized input-output model of group processes. The one selected for discussion here is a modified version of one presented by Hackman and Morris,[10] and appears in Figure 4.

Here interaction processes include all actions engaged in by group members between times 1 and 2. Conceivably they might also include strategies, etc., as well; however, the authors chose to limit discussion to observable behaviors. The time period between t_1 and t_2 is purposefully left unspecified and may be thought of as encompassing a distinct communications "event," for example, a meeting or conference call. The complete decision-making process may include several such events occurring in serial fashion.

Examination of the model reveals the process focus. If one systematically varies one or more input variables and subsequently observes consistent changes in one or more dependent variables, then the process may be inferred to have played a mediating function. Clues to the mechanism underlying that function are secured through direct observation of differing processes. Alternatively, when direct observation is impractical, participants' post-discussion perceptions may well suffice.

Utilizing this model, or similar models, as an organizing framework,

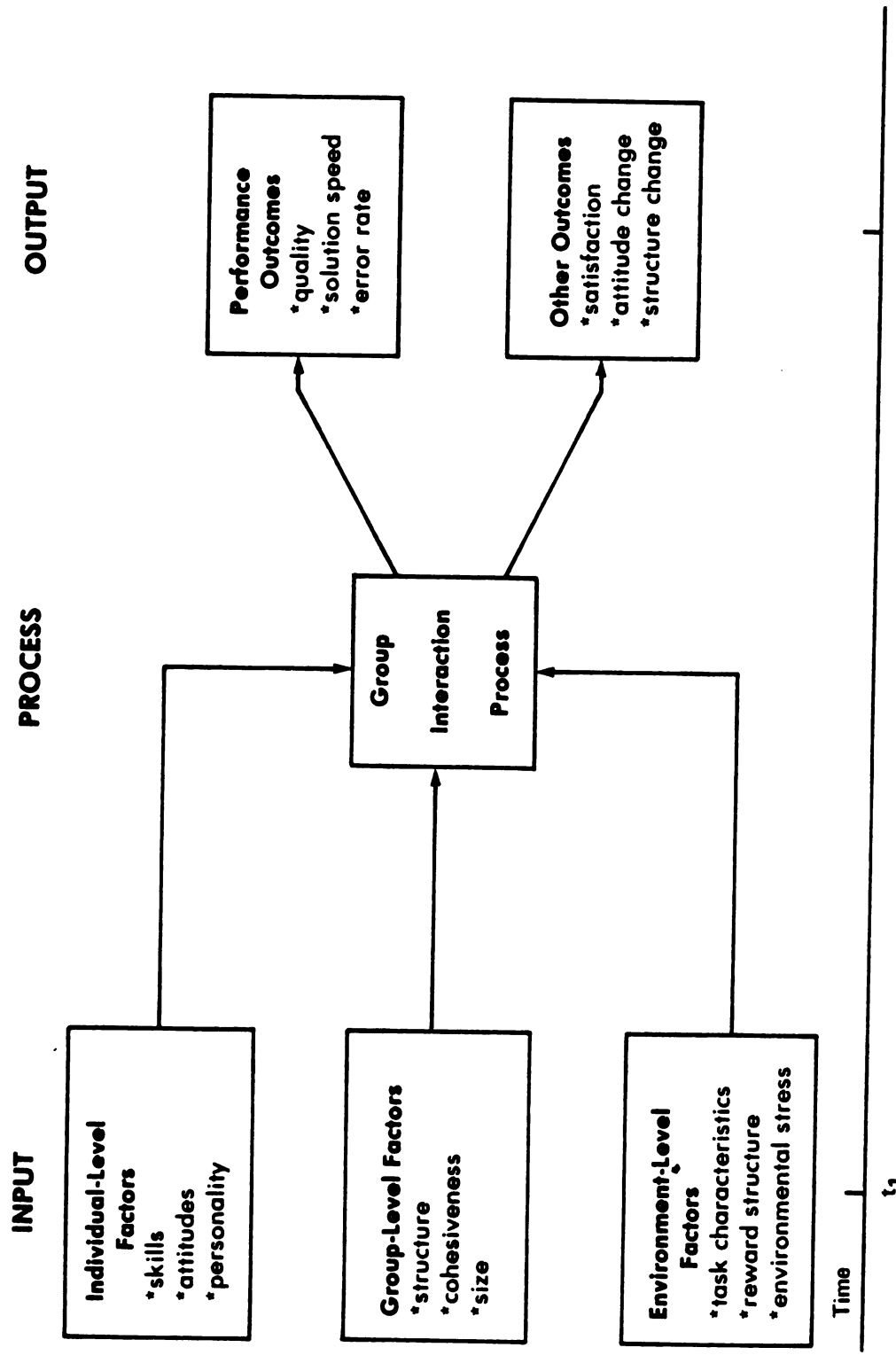


FIGURE 4 – THE MODIFIED HACKMAN-MORRIS MODEL

examples of relevant research findings include:

- Obvious solutions tend to be adopted quickly, while less obvious, though correct, solutions may remain totally undiscovered.
- Members generally will give consideration to less obvious solutions after having been made aware of them.
- Group leaders who are permissive and encourage evaluation of multiple alternatives perform better in helping the group to avoid obvious but incorrect solutions.[11]

More precise specification of the exact mechanisms of process function should be possible when the entire input-process-output sequence is considered. Using a canonical correlation analysis to link sixteen predictor activity dimensions, e.g., defend, clarify, repeat, to eight group product dimensions, e.g., originality and adequacy, across three intellective task types, Hackman and Morris[12] reported several significant relationships. For problem-solving tasks, which most closely resemble the type of task of interest here, group members' attempts to structure an answer and the sequence of seeking calrification, defending an alternative and repeating were highly positively correlated with creativity, quality and other criterion variables.

However, an overall pattern of correlations explaining the entire input-process-output sequence was not found. This result was also obtained in a similar study by Sorenson in which significant relationships between input-process and input-output were found but the full sequence was not elaborated.[13]

A suggested explanation for this failure centers on the use of what is termed a "molecular" focus to categorizing the mediating process. Anderson[14] in discussing impacts of source-message interaction on influence attempts and attitude change in group discussion notes that

each statement by a member constitutes a unique source-communication-issue unit. In a molecular analysis one attempts to relate individual units or patterns of units to unique outcomes.

A representative example of the molecular approach is the earlier mentioned work undertaken by Vinokur[15] and others to explain choice shifts following group discussion. The model is of the subjective expected utility type in which each argument relevant to the group decision, in this case alternative choice, is supposed to have measurable impact on group members' preferences by either enhancing or lessening the perceived utility or value of one or more of the alternatives.

Mathematically,

$$SEU = \sum_{i=1}^{n} P_i U_i. \qquad \{1\}$$

where SEU is subjective expected utility,

P_i is the i^{th} person's subjective probability estimate of an alternative's success,

U_i is the i^{th} person's perceived utility associated with an outcome following choice.

Thus each alternative will have a group level utility value found by summing over group members the product of their individual probability estimates of an outcome's occurrence and the utility of that occurrence. In the context of the risky shift investigations, choices were limited to two, risky and cautious alternatives, and outcomes were also binary, success vs. failure. To make the model mathematically tractable it is assumed that,

$$U_s > U_c > U_f. \qquad \{2\}$$

Where U_s is the utility derived from success of the risky alternative,

U_c is the utility derived from the cautious alternative which is certain, i.e., $P_c = 1$,

U_f is the utility derived from failure of the risky alternative.

From which it follows that,

$$SEU_r = p\ U_s + (1 - p)U_f, \quad \{3\}$$

$$SEU_c = 1\ U_c, \quad \{4\}$$

and if $SEU_r \geq SEU_c$, {5}

then $p\ U_s + (1 - p)U_f \geq 1 \cdot U_c$, {6}

so that $p \geq \dfrac{U_c - U_f}{U_s - U_f}$, {7}

where SEU_r refers to the utility associated with the risky alternative and SEU_c to the cautious alternative's expected utility. Thus the lowest probability of success a subject will consider acceptable is estimated by quantifying their utilities for the alternatives.[16]

Relating this back to the Hackman-Morris model, if utility measurements are taken at various time periods before and after group discussion it can be determined whether a choice shift has occurred. That is, if $p_2 > p_1$ a risky shift has occurred and vice versa. As was mentioned earlier, much research utilizing dimensions other than risk has now taken place; however, the fundamental approach has remained the same.

Operationalizing the above model at the molecular level involves acquiring from each group member a written list of arguments they have generated pro and con to each alternative, and utility measures prior to the laboratory discussion session. Based on the number and distribution of arguments across group members, an index called a diffusion potential is derived which indicates the average number of people in the group who were not previously aware of a particular argument but

were exposed to it during the group discussion. The influence potential of each argument is found by taking the mean of the group members' self-reported persuasiveness scores. Finally, the mean total impact of all of the arguments favoring choice of a particular alternative is given by,

$$MTI_r = \sum_{i=1}^{k} D_i I_i \Big/ \sum_{i=1}^{k} D_i \qquad \{8\}$$

where MTI_r is the mean total impact of the arguments favoring the r^{th} alternative,

D_i is the diffusion potential of the i^{th} argument,

I_i is the influence potential of the i^{th} argument.

When the alternatives under consideration are the dichotomous risky vs. cautious choices than MTI_r becomes MTR and MTC in the Vinokur framework. Furthermore when MTR>MTC a pro-risk choice shift can be expected to occur.[17]

From a communication theorist's point of view, the above model incorporates only message factors as independent variables. Another molecular model of group process incorporating source and issue, as well as message, factors is provided by Anderson.[18] That is,

$$R = C + \sum_{i=o}^{n} w_i s_i \qquad \{9\}$$

where R is a numerically scaled response, e.g., an attitude or preference score,

C is a scaling constant permitting an arbitrary zero point,

w_i is the psychological importance of the i^{th} stimulus to the subject,

s_i is the scale value which measures the location of the i^{th} stimulus on a judgmental dimension, e.g., persuasiveness.

Now, if the influence of source, message and issue factors are permitted to vary independently, equation {9} above becomes,

$$R = C + \sum_{l=o}^{L} \sum_{m=o}^{M} \sum_{n=o}^{N} W_{lmn} S_{lm}. \qquad \{10\}$$

Where W_{lmn} is the psychological weight or value of the l^{th} informational stimulus, along the m^{th} judgmental dimension, from the n^{th} source.

S_{lm} is the scale value or message polarity of that same stimulus on the same dimension.

The Anderson derived model can be related to the Vinokur model by equating stimuli in the former to arguments in the latter and responses to utility estimates respectively.

Both models stress the impact of informational influence on attitude change, group process and alternative choice, although the Anderson formulation provides somewhat more flexibility in this regard by incorporating affective elements. Application to the current problem is limited by the constraints imposed by the choice shift framework. Examination of the Vinokur model reveals that choice options are held constant, that is, considered pairwise with a certain alternative, while changes in utility scores across time and individuals in the group are measured.

The model becomes conceptually more interesting if options are allowed to vary as well and changes in probability of success estimates used as indicators of adoption likelihood. That is, we are less concerned that Vendor 1, initially preferred by group members prior to discussion is preferred even more so after discussion, even though a group shift has taken place. However, if pre-discussion $p_2 > p_1$ and post-

discussion $p_1 > p_2$, we may infer that during the discussion arguments were brought before the group which caused a preference swing type of shift.

Returning to the Anderson model it is clear that each statement made by a group member constitutes a unique message-source-issue combination. Each such combination favoring a particular option increases its perceived utility to the extent that several conditions hold. These are that the statement itself be persuasive, that the communicator, i.e., group member, be perceived as credible and finally that the message content of the statement be perceived as relevant to the task at hand. Employing a utility maximization rule, the group will select the alternative having the highest SEU, hence lowest p, following assimilation of all of the distinct source-message-issue events which took place.

However, if the group employs a choice simplification rule, either consciously or subconsciously, the first alternative whose p falls below some critical value, either consciously or subconsciously developed, will be selected and deliberations cease.[19]

Model Specification

At this point the necessary background has been provided to permit discussion of the process model which serves as the focus of the present investigation. The model actually consists of two distinct but related sub-models each designed for different purposes. The first, the generic decision process model, appears in Figure 5.

The generic group process model was derived directly from the Hackman-Morris model described earlier but with modifications to both highlight key features and permit better integration of the specific model into the Sheth framework. The Hackman-Morris model does not by

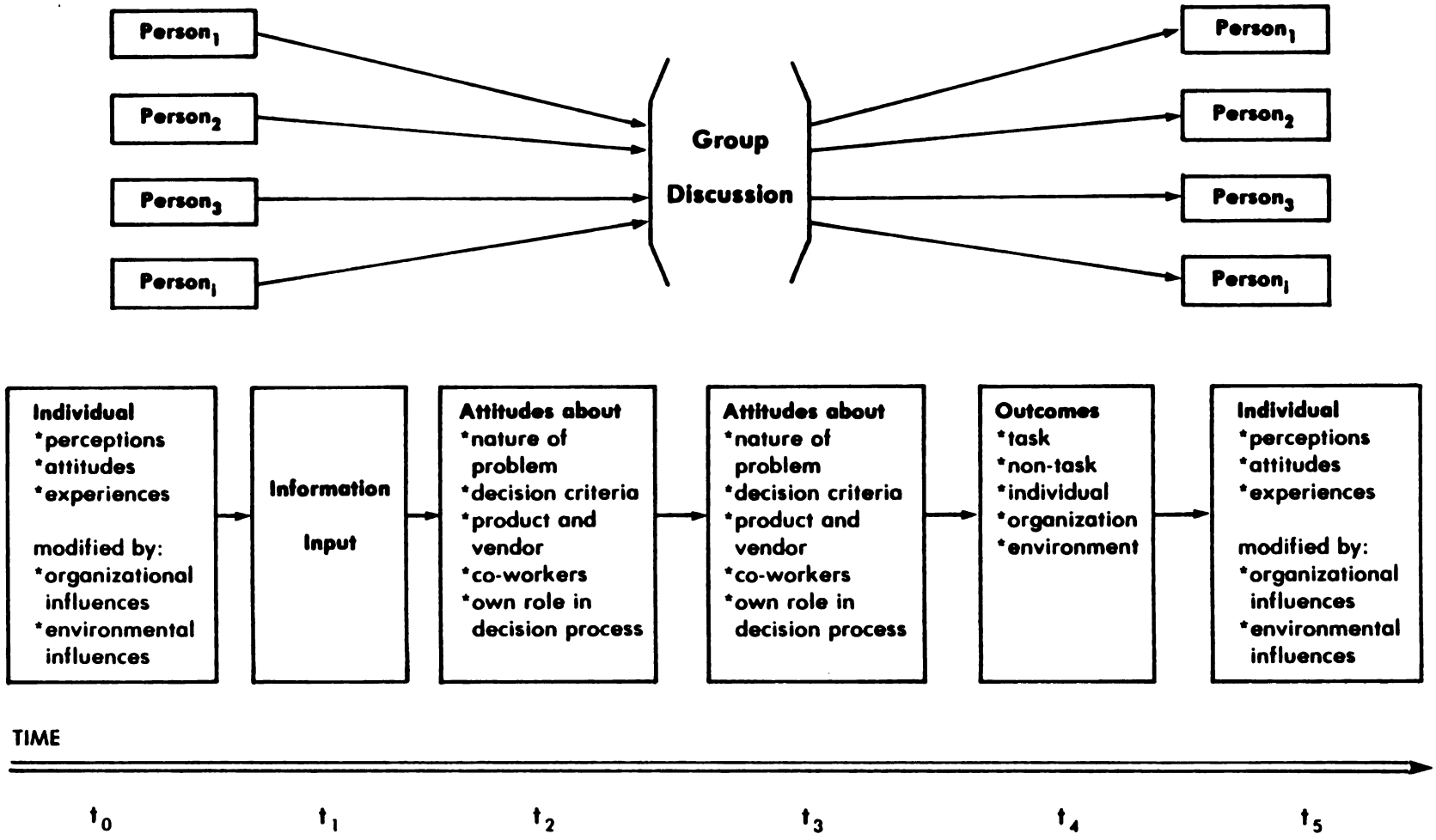
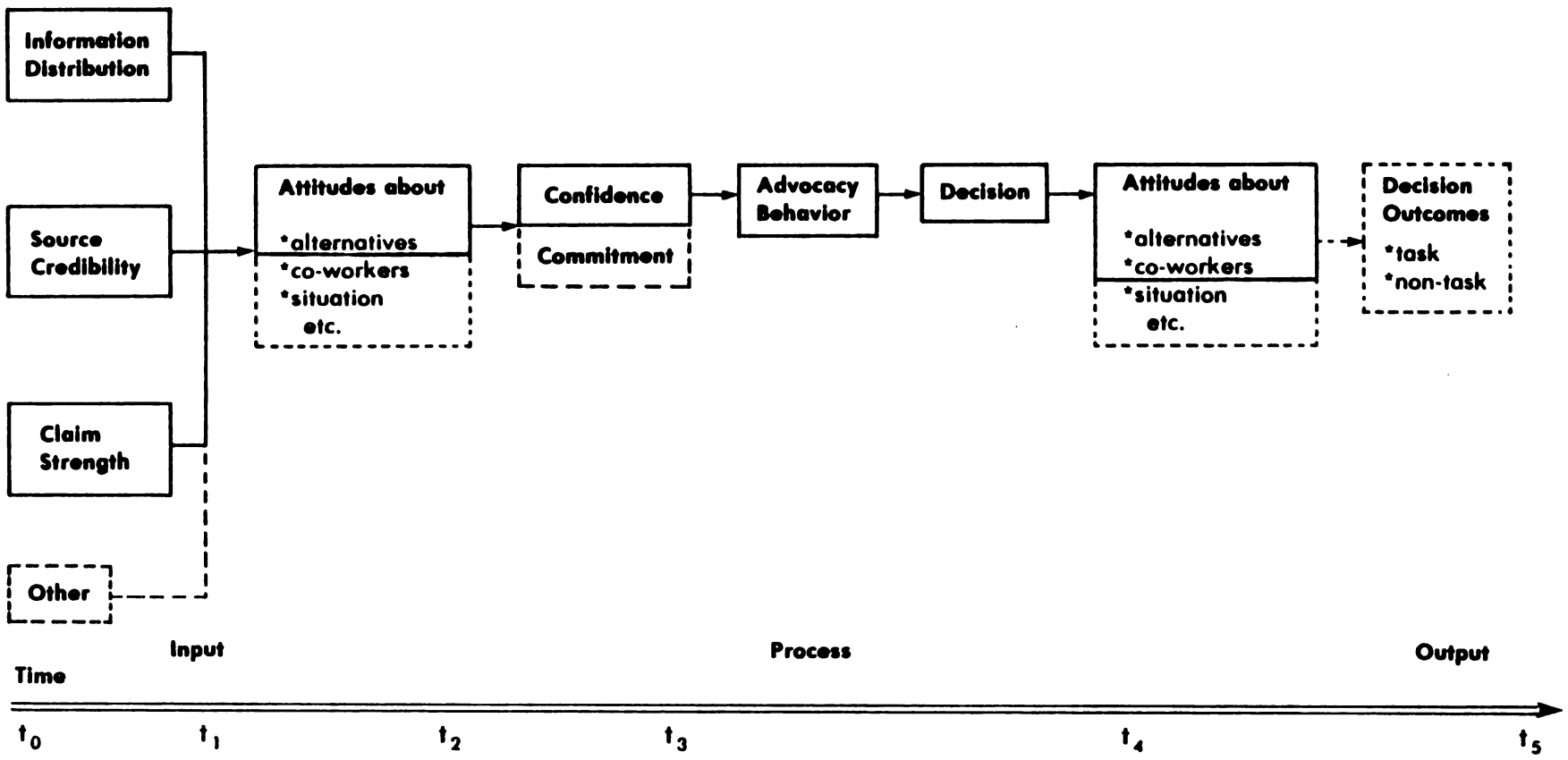


FIGURE 5 – THE GENERIC DECISION PROCESS MODEL

itself adequately provide contextual relevance to group purchasing situations, likewise the Sheth model is most relevant to the purchasing situation yet lacks process orientated detail. The generic process model fills this gap. One function performed by the generic model is to serve as an organizing bridge between the conflict resolution component of the Sheth model and the substantive conceptual content of the specific model which appears in Figure 6.

Another function the generic model performs is to stress certain points important to consideration of research design issues in the group problem-solving and decision-making area. Concerning the latter is is readily apparent that research emphasis must remain with the individual as the unit of data collection. Investigations employing a group or organizational unit as the unit of data collection fail to recognize the significant role played by intra-departmental personal influence. On the other hand, to study the individual in isolation is to deny the existence of social and organizational factors entirely. An acceptable compromise is struck when individuals remain units of data collection; however, analysis is performed at the group level by employing either summated or averaged variables indicating group outputs. This approach is evidenced in the choice shift area as mean pre- vs. post-discussion utility estimates are used to detect shifts.

In addition to the emphasis on the distinction between unit of data collection and level of data analysis the generic process model makes explicit the time sequenced nature of organizational purchasing. More specifically, it focuses attention on a face-to-face group discussion as one, albeit very important, event in a series. Thus in many cases the actual process outlined in the buygrid model, i.e., from problem recognition through alternative evaluation to final choice extends over



Note: Constructs and Relationships indicated with dashed lines are not explicitly tested in this study.

FIGURE 6 – THE CAUSAL PROCESS MODEL OF GROUP CHOICE

several weeks or months. However, it is quite likely that the individuals involved may spend only a fraction of their working days in this time period on this particular problem.

For this reason, despite the lack of time spent in group meetings, their value is enhanced due to the opportunity provided to express opinions, air differences, decide on next steps, etc. Inasmuch as individuals do move into and out of tasks over time, public positions taken in group meetings may be made from relatively sparse information bases. Thus vendor induced alterations in those bases may prove fruitful.

If one pursues a molecular paradigm as described earlier, the building block approach is continued down to the meetings as well and these are viewed as a sequence of distinct source-message-issue events. The other alternative is a molar approach which focuses on influence strategies adopted by group members rather than observed patterns of interaction.

Examining the generic model it is evident that the present investigation more nearly approximates the molar approach, as interaction sequences within the discussion phase are not elaborated. As with the Hackman-Morris work and many other group-oriented studies direct measures are taken only of inputs and outputs while conclusions about processes are drawn inferentially. Despite inability to puruse the molecular approach within the present study's framework, it remains of great value in focusing attention on cognitive processes thought to underlie interaction.

Returning to the first function performed by the generic model, it assists in making more plain what is meant by Sheth's discussion of bargaining as a conflict resolution mode. That is, the bargaining

process is one characterized by trading of information rather than money or tokens in which participants seek to enhance personal status and simultaneously achieve task-related goals. In this light is is clear that individuals' attitudes about alternatives under consideration are not the only ones that are influential in their behavior. An individual's perceptions of task importance, his own ability to be influential, and others in the group should color his approach to the problem.

Following choice, decision participants develop attitudes about themselves, others and the entire process which are largely a function of the conflict resolution mechanism. In the longer term they receive feedback about the quality of their choice from other organizational members. Thus outcomes experienced by users of newly purchased equipment become translated into personal outcomes for decision makers so that the experience base upon which the next decision rests is different from what it was previously.

Turning now to the specific model, one can see how the particular variables of interest are operationalized. Recalling the discussion of communications research in the preceding chapter, it was noted that several factors are thought to influence interaction mechanisms and outputs. The three factors chosen for investigation in this study are distribution of information among group members, perceived credibility of an attributed source of that information, and finally language intensity or strength of claim made in presenting the information.

Individually each has been demonstrated to have some impact on group processes and outcomes, e.g., willingness to contribute and satisfaction. It is not known at present what, if any, interaction effects exist among them. Information distribution and claim strength are the two most vendor influenceable variables, while source credibility plays

more of a moderator role. That is, a sales representative can feed information to only one or all group members and may do so using relatively neutral or strongly worded language. The extent to which these factors influence individual attitudes is in turn a function of the sales representative's perceived credibility.

Based on substantive content of information presented and these three factors, individuals develop attitudes regarding alternatives and also evaluate their own position in the group regarding this decision. That self-evaluation is primarily reflected in specific self-confidence which is conceptualized as a causal factor in the individual's willingness to utilize whatever information is available to him. It may also be reflected as commitment to an alternative; however, measurement of commitment prior to discussion constitutes a form of public disclosure which has been shown to influence strength of commitment, and so to avoid an instrumentality threat to internal validity commitment is not expressly tested.

The actual influence mechanism is the extent and quality of active verbal advocacy by individuals for and against available alternatives. Both group problem-solving students in social psychology and those following the informational influence school in the choice shift area have noted strongly that verbal advocacy is the key determinant of choice.

Following decision individual members once again solidify attitudes about themselves, alternatives and other group members as well since discussion has provided an opportunity for peer as well as self-evaluation. Note that perceptions of other group members are not observed prior to discussion as there is no theory to suggest these

factors should influence peer perceptions until after discussion has taken place.

Finally, longer term outcomes and consequential feedback mechanisms will occur; however, time limitations imposed by the research design chosen for model validation prevented measurement of their type or extent.

Model Validation

Examining the time line appearing at the bottom of Figure 6, times at which research events occur are noted. At t_1 subjects are given research materials and given time to assimilate information in them, at t_2 individual level measures of alternative attribute ratings, overall preference, behavioral intent, perceived source credibility and specific self-confidence are taken. At t_3 post-discussion alternative attribute ratings, overall preference and behavioral intent are repeated and in addition self- and/or peer evaluations over dimensions of liking, perceived advocacy behavior and perceived leadership are taken.

Utilizing the scores described above, the following substantive hypotheses are tested.

I. a. Information distribution influences pre-discussion individual attitudes, self-confidence and behavioral intent.

b. Information distribution influences post-discussion group mean attitudes, behavioral intent and perceived advocacy and leadership.

II. a. Perceived credibility of an attributed source influences pre-discussion individual attitudes, self-confidence and behavioral intent.

b. Perceived credibility of an attributed source influences post-discussion group mean attitudes, behavioral intent and perceived advocacy and leadership.

III. a. Strength of claim (language intensity) influences pre-discussion individual attitudes, self-confidence and behavioral intent.

b. Strength of claim (language intensity) influences post-discussion group mean attitudes, behavioral intent and perceived advocacy and leadership.

IV. The independent variables have a combined effect which is greater than the sum of their individual effects.

V. There exists a relationship between perceived advocacy favoring an alternative and group adoption of that alternative.

These substantive hypotheses are tested by means of the following working hypotheses.

H^{o}_{Ia1}: The main effect for information distribution on individual pre-discussion overall vendor preference is zero.

H^{o}_{Ia2}: The main effect for information distribution on individual pre-discussion specific self-confidence is zero.

H^{o}_{Ia3}: The main effect for information distribution on individual pre-discussion behavioral intent is zero.

H^{o}_{Ib1}: The main effect for information distribution on post-discussion group mean overall vendor preference is zero.

H^{o}_{Ib2}: The main effect for information distribution on post-discussion group mean behavioral intent is zero.

H^{o}_{Ib3}: The main effect for information distribution on post-

discussion peer evaluations of subjects' advocacy behavior is zero.

H^{o}_{Ib4}: The main effect for information distribution on post-discussion peer evaluations of subjects' leadership behavior is zero.

Null hypotheses associated with substantive Hypotheses II and III, that is, H^{o}_{IIa} to H^{o}_{IIb4} and H^{o}_{IIIa1} to H^{o}_{IIIb4}, are identical to those enumerated above except that the appropriate factor names are substituted for information distribution.

H^{o}_{IV1}: The two-way interaction effect of information distribution and source credibility on individual pre-discussion overall vendor preference is zero.

H^{o}_{IV2}: The two-way interaction effect of information distribution and source credibility on individual pre-discussion specific self-confidence is zero.

H^{o}_{IV3}: The two-way interaction effect of information distribution and source credibility on individual pre-discussion behavioral intent is zero.

H^{o}_{IV4}: The two-way interaction effect of information distribution and source credibility on post-discussion group mean overall vendor preference is zero.

H^{o}_{IV5}: The two-way interaction effect of information distribution and source credibility on post-discussion group mean behavioral intent is zero.

H^{o}_{IV6}: The two-way interaction effect of information distribution and source credibility on post-discussion peer evaluations of subjects' advocacy behavior is zero.

H^{o}_{IV7}: The two-way interaction effect of information distribution

and source credibility on post-discussion peer evaluations of subjects' leadership behavior is zero.

The information distribution by claim strength and source credibility by claim strength two-way interactions', H^{o}_{IV8} to H^{o}_{IV14} and H^{o}_{IV15} to H^{o}_{IV21} respectively, and the three-way information distribution by source credibility by claim strength interactions', H^{o}_{IV22} to H^{o}_{IV28}, null hypotheses are identical in format to H^{o}_{IV1} to H^{o}_{IV7} respectively.

H^{o}_{V1}: The Pearson product moment correlation between post-discussion peer evaluations of subjects' advocacy scores and post-discussion group mean vendor evaluation scores for alternatives favored by subjects is zero.

The statistical model from which hypotheses H^{o}_{Ia1} through H^{o}_{IV28} flow and other details of model validation are the subject of the following chapter.

REFERENCES

1. Scott, Jerome E. and Peter Wright, "Modeling an Organizational Buyer's Product Evaluation Strategy: Validity and Procedural Considerations." Journal of Marketing Research, 13 (August 1976), 211-24.

2. Webster, F. E., Jr., "Industrial Buying Behavior: A State of the Art Appraisal," in Marketing in a Changing World, B. A. Morin (ed.), Chicago: American Marketing Association (1969), 256.

3. Ferguson, Wade, "A Critical Review of Recent Organizational Buying Research." Industrial Marketing Management, 7 (1978), 225-30.

4. Wilson, David T., "Models of Organization Buying Behavior: Some Observations," in Buyer/Consumer Information Processing, G. D. Hughes and D. L. Ray (eds.), Chapel Hill, North Carolina: The University of North Carolina Press (1974), 136-41.

5. Grønhaug, Kjell, "Autonomous vs. Joint Decisions in Organizational Buying." Industrial Marketing Management, 4 (1975), 265-71.

6. Lambert, D. R., R. J. Dornoff and Jerome B. Kernan, "The Industrial Buyer and the Postchoice Evaluation Process." Journal of Marketing Research, 14 (May 1977), 246-51.

7. Grønhaug, op.cit., 269.

8. Glaser, B. G. and A. L. Strauss, The Discovery of Grounded Theory: Strategies for Qualitative Research, Chicago: Aldine Publishing Co. (1967), 97.

9. Ibid., 28.

10. Sheth, J. N., "A Model of Industrial Buyer Behavior," Journal of Marketing, 37 (October 1973), 54.

11. Hackman, J. R. and C. G. Morris, "Group Tasks, Group Interaction Process and Group Performance Effectiveness: A Review and Proposed Integration." Advances in Experimental Social Psychology (1975), 45-61.

12. Ibid., 52.

13. Ibid., 55.

14. Ibid., 56.

15. Anderson, N. H., "Integration Theory and Attitude Change." Psychological Review, 78 (1971), 196-98.

16. Vinokur, A., "Review and Theoretical Analysis of the Effects of Group Processes Upon Individual and Group Decisions Involving Risk." Psychological Bulletin, 78 (1971), 247.

17. Ibid., 247.

18. Vinokur, A. and E. Burnstein, "Effects of Partially Shared Persuasive Arguments on Group Induced Shifts: A Group Problem-Solving Approach." Journal of Personality and Social Psychology, 29 (1974), 310-11.

19. Anderson, N. H., op.cit., 197-8.

20. Krapfel, R. "A Decision Process Approach to Modeling Organizational Buyer Behavior," in Proceedings, Educators Conference, Chicago: American Marketing Association (1978), 116-20.

Chapter IV

RESEARCH METHOD

Experimental Design

The model described in the previous chapter suggests three independent variables, information distribution, source credibility, and claim strength as being causally related to four dependent variables, specific self-confidence, perceived advocacy, vendor evaluation and behavioral intent. In order to test independent variable impacts, singly and in combination, two experiments have been designed. After a brief discussion of behavioral science experiments, each is described in detail.

The purpose of experimentation is to test hypotheses. The general model for a single factor experiment, i.e., only one independent variable, may be represented by:

$$Y_{ij} = \mu + \alpha_i + \varepsilon_{ij}. \qquad \{1\}$$

Where Y_{ij} is the observed value of the dependent variable on the j^{th} subject following application of the i^{th} treatment level,

μ is the effect common to all subjects regardless of treatment conditions or individual differences,

α_i is the effect due to the independent variable,

ε_{ij} is the error component arising from both random and non-random sources.

The null hypothesis tested is:

$$H_o: \ \alpha_i = 0 \qquad \{2\}$$

The statistical test employed is the F-test in which a calculated F-statistic, given by,

$$F=S\left|\sum_{i}^{a}(\bar{A}_i-\bar{T})^2\right|/df_a \div \sum_{ij}^{as}(AS_{ij}-\bar{A}_i)^2/df_e \quad \{3\}$$

is compared with the appropriate critical value for a desired confidence level. Thus, treatment means, $\bar{A}_i$, are compared to the grand mean, $\bar{T}$, and if the difference is larger than that which would have been expected on a chance basis alone, the null hypothesis of no treatment effect is rejected. A common variant of this type of design is post-test only with control as described by Campbell and Stanley.[1]

However, the theoretical group process model involves not one but three independent variables or factors. While any of several designs may have served, a fixed effects three-way factorial design was chosen for initial model validation, followed by a two-factor repeated measures design for cross validation.

Factorial design characteristics indicating its choice are:

1. The design is "fully crossed" which is to say that all possible combinations of independent variables are observed. This feature aids in specifying interactions among factors and is a compelling argument for use of a fully factorial design. Only where time and money constraints require, or prior evidence warrants, should incomplete designs be employed, i.e., those not incorporating <u>all</u> independent variable combinations.
2. The design is efficient in the sense that relatively large amounts of information may be gained from relatively few subjects. That is, several single factor experiments will not provide the same amount of information as a single factorial experiment incorporating the same independent variables and using the same total number of subjects.
3. Factorial designs provide for controls necessary for adequate

internal validity without requiring a separate control group to which no treatment is applied.

The general model for a three-factor, fixed effects experimental design is[2]:

$$Y_{ijkl} = \mu+\alpha_i+\beta_j+\gamma_k+\alpha\beta_{ij}+\alpha\gamma_{ik}+\beta\gamma_{jk}+\alpha\beta\gamma_{ijk}+\varepsilon_{ijkl} \quad \{4\}$$

where Y_{ijkl} is the observed dependent variable value for the l^{th} subject,

$\alpha_i, \beta_j, \gamma_k$ are the main effects for each of the three factors when averaged over all levels of each of the other factors,

$\alpha\beta_{ij}, \alpha\gamma_{ik}, \beta\gamma_{jk}$ are the two-way interactions among factors,

$\alpha\beta\gamma_{ijk}$ is a three-way interaction term,

ε_{ijkl} is the error component.

Several null hypotheses are tested:

$$H_1^o: \quad \alpha_i = \beta_j = \gamma_k = 0 \quad \{5\}$$

$$H_2^o: \quad \alpha\beta_{ij} = \alpha\gamma_{ik} = \beta\gamma_{jk} = 0 \quad \{6\}$$

$$H_3^o: \quad \alpha\beta\gamma_{ijk} = 0 \quad \{7\}$$

The statistical procedure employed to test these hypotheses is three-way analysis of variance (ANOVA). For each of the seven separate variance components identified above, an F-statistic is calculated and compared to a critical value for the appropriate confidence level.

Table 2 is a general example of a fixed effects, three-factor summary ANOVA table.

independent factors are non-metric, i.e., do not meet interval level criteria. Figure 7 summarizes the student sample experimental design.

The practitioner sample experimental design is a fixed effects, repeated measures two-factor design. In the design described previously, each experimental subject is exposed to only one unique combination of treatment levels. This is not the case in a repeated measures design. Here subjects receive more than one treatment application. Repeated measures designs are often employed in studies with cost or sampling restrictions. In general, non-repeated measures designs are preferred as sequential exposure to multiple treatment combinations introduces a threat to internal validity termed a carry-over effect. That is, if one treatment combination consistently follows another, effects measured in the second may be the result of factors contained in both treatments. This produces confounding in interpretation of the second treatment's effect.

The problem is commonly handled by randomizing order of treatment presentation and that procedure was employed here. In addition to moving to a repeated measures design a decision was made to exclude the claim intensity factor from the practitioner experiment. This was done due to limited practitioner sampling frame size and the fact that preliminary analyses of student sample data indicated that claim strength is weakest in explanatory power.

While the general model for this type of design is essentially similar to that described above, computational procedures change to accommodate introduction of repeated measures. Furthermore, the design incorporates repeated measures only with respect to one factor, source credibility. That is, each experimental subject was exposed to only one

Table 2

Example Fixed Effects, Three-Factor ANOVA Table

Source	Sums of Squares	Mean Square	D
A	SS_A	SS_A/df_A	MS_A/MS_E
B	SS_B	SS_B/df_B	MS_B/MS_E
C	SS_C	SS_C/df_C	MS_C/MS_E
AB	SS_{AB}	$SS_{AB}/(df_A)\ (df_B)$	MS_{AB}/MS_E
AC	SS_{AC}	$SS_{AC}/(df_A)\ (df_C)$	MS_{AC}/MS_E
BC	SS_{BC}	$SS_{BC}/(df_B)\ (df_C)$	MS_{BC}/MS_E
ABC	SS_{ABC}	$SS_{ABC}/(df_A)\ (df_B)\ (df_C)$	MS_{ABC}/MS_E
Error	SS_E	SS_E/df_E	

For example, if the dependent construct being measured were specific self-confidence, and term A in the table above corresponds to the main effect for information distribution, then at a given confidence level, a calculated F-statistic larger than the corresponding critical value would lead one to conclude that distribution of information among group members does in fact have some impact on problem specific self-confidence at the individual level. These same analyses are repeated for each of the other dependent variables, i.e., perceived advocacy, vendor evaluation and behavioral intent.

It should be noted that interpretation of the results of such an experiment is severely restricted. That is, in a fixed effects design, null hypothesis rejection for any interaction or main effect only permits conclusions to be drawn with respect to the particular levels of the independent variables actually included in the design. It is improper to attempt generalization beyond the range of values tested. This cautionary note is especially relevant to experiments such as this one in which

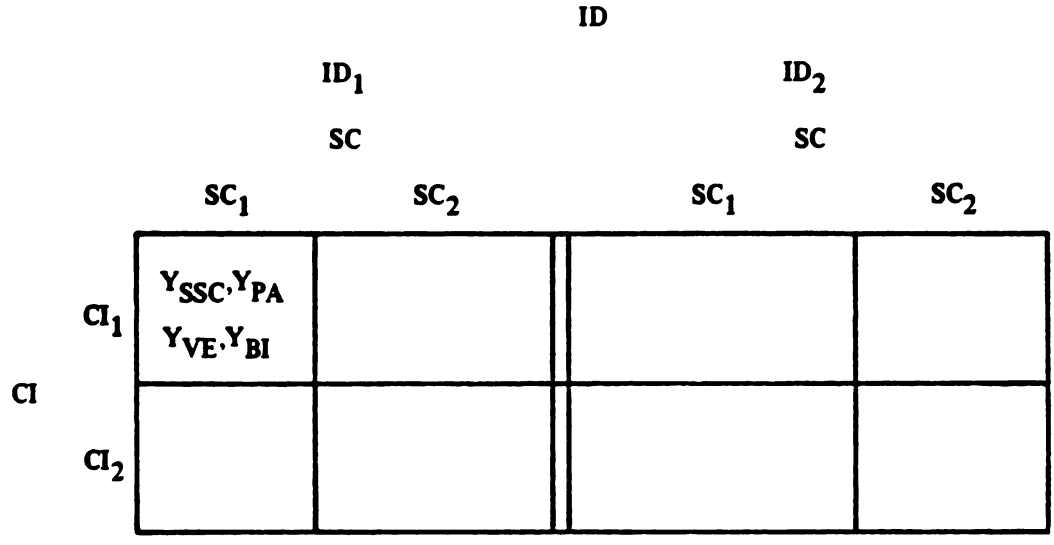
independent factors are non-metric, i.e., do not meet interval level criteria.

Figure 7 summarizes the student sample experimental design.

The practitioner sample experimental design is a fixed effects, repeated measures two-factor design. In the design described previously, each experimental subject is exposed to only one unique combination of treatment levels. This is not the case in a repeated measures design. Here subjects receive more than one treatment application. Repeated measures designs are often employed in studies with cost or sampling restrictions. In general, non-repeated measures designs are preferred as sequential exposure to multiple treatment combinations introduces a threat to internal validity termed a carry-over effect. That is, if one treatment combination consistently follows another, effects measured in the second may be the result of factors contained in both treatments. This produces confounding in interpretation of the second treatment's effect.

The problem is commonly handled by randomizing order of treatment presentation and that procedure was employed here. In addition to moving to a repeated measures design a decision was made to exclude the claim intensity factor from the practitioner experiment. This was done due to limited practitioner sampling frame size and the fact that preliminary analyses of validation sample data indicated that claim strength is weakest in explanatory power.

While the general model for this type of design is essentially similar to that described above, computational procedures change to accommodate introduction of repeated measures. Furthermore, the design incorporates repeated measures only with respect to one factor, source credibility. That is, each experimental subject was exposed to only one



Independent Variables (Factors):

Information Distribution, two levels, equal=ID_1, unequal=ID_2.
Source Credibility, two levels, low=SC_1, high=SC_2.
Claim Intensity, two levels, moderate=CI_1, strong=CI_2.

Dependent Variables:

Specific Self-Confidence, individual level, prediscussion, Y_{SSC}.
Perceived Advocacy, group level, post-discussion, Y_{PA}.
Vendor Evaluation, group level, post-discussion, Y_{VE}.
Behavioral Intent, group level, post-discussion, Y_{BI}.

FIGURE 7 – THE STUDENT SAMPLE EXPERIMENTAL DESIGN

level of the information distribution factor but in combination with both levels of the source credibility factor. Technically, subjects represent a third factor, as subject by treatment variance terms are meaningful with repeated measures designs. Figure 8 presents the experimental design employed with the practitioner sample.

Notationally, this type of design is often referred to as a mixed or split plot type of design and is represented as an A X (BxS) design.[3] Here information distribution corresponds to factor A, source credibility to factor B, and subjects to factor S.

Use of this type of design is widespread; however, it is computationally less straightforward than the design described in Figure 7. The appropriate summary ANOVA table appears below.

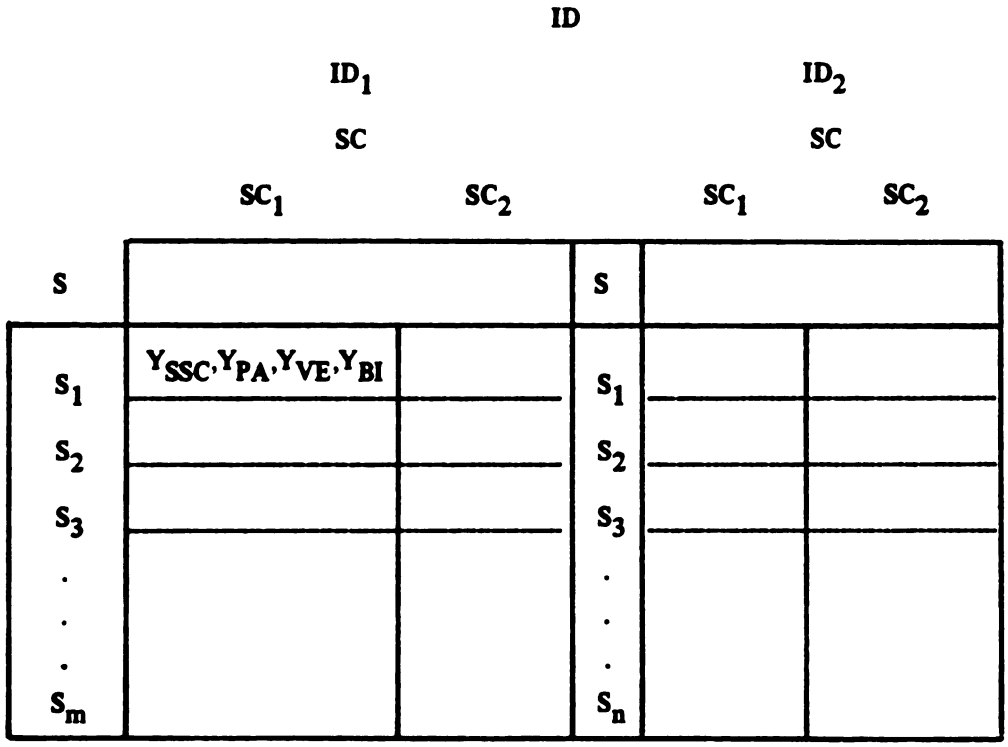
Table 3

Example Summary ANOVA Table for an A X (BxS) Design

Source	Sums of Squares	Mean Square	E
A	SS_A	SS_A/df_A	$MS_A/MS_{S/A}$
S/A	$SS_{S/A}$	$SS_{S/A}/df\ S/A$	None
B	SS_B	SS_B/df_B	$MS_B/MS_{BxS/A}$
AB	SS_{AB}	SS_{AB}/df_{AB}	$MS_{AB}/MS_{BxS/A}$
BxS/A	$SS_{BxS/A}$	$SS_{BxS/A}/df_{BxS/A}$	

Note that subjects is a nested factor in the non-repeated factor and that in the denominators of the F-statistics MS_E is replaced by mean squares based on the nested subjects' factor.

Given the constraints that suggest use of a repeated measures design initially, the mixed design employed here is preferred for its greater sensitivity within the repeated measures portion.[4]



Independent Variables (Factors):

Information Distribution, two levels, equal=ID_1, unequal=ID_2, nonrepeated factor.

Source Credibility, two levels, low=SC_1, high=SC_2, repeated factor.

Subjects, m=n levels, nested factor.

Dependent Variables

Specific Self-Confidence, individual level, post-discussion, Y_{SSC}.

Perceived Advocacy, group level, post-discussion, Y_{PA}.

Vendor Evaluation, group level, post-disucssion Y_{VE}.

Behavioral Intent, group level, post-discussion Y_{BI}.

FIGURE 8 – THE PRACTITIONER SAMPLE EXPERIMENTAL DESIGN

Population

Two distinct populations were sampled to provide a subject pool. The first consists of a combination of undergraduate seniors and first-term MBA students. Students were selected on the basis of enrollment in courses offered at Michigan State University in the 1977-78 academic year. All student participants were volunteers. Permission to use students as experimental subjects was granted on September 13, 1977, by Dr. Henry E. Bredeck, Chairman of the University Committee on Research Involving Human Subjects. A copy of that approval appears in Appendix 1. No pre-screening was undertaken to attempt matching along dimensions of problem solving or persuasive communication abilities, as variance attributable to these sources is controlled through randomization in treatment assignment.

The sampling procedure is essentially a convenience one. While probability samples are generally preferred over their non-probability counterparts when ability to generalize back to the population is of interest, e.g., in parameter estimation, the issue of external validity was not of concern with the student sample. That is, the ability of the model to predict performance among other groups of students assembled under similar conditions is not relevant to the research problem. A total of 176 students participated in the experiment.

The second sampling frame consists of business practitioners currently actively engaged in vendor evaluation and selection. Representatives of this population were drawn from the ranks of a single firm, a large multi-divisioned Fortune 500 manufacturer located in the Midwest. Many of these individuals work together in natural decision-making groups within their respective operating units and in these cases the experiment

was run with the group at their location. Individuals in this category were generally divisional level office services managers and their staff assistants who are charged with vendor relations responsibility for office equipment.

The other category of practitioner subjects was buyers and assistant buyers of non-product related materials and supplies. These individuals function in purchasing departments of both the divisions the office services managers were drawn from and others as well. These buyers typically do not function in groups rather each has responsibility for a particular product group. Only a few of these individuals were more than casually familiar with the office equipment area. The experiment was run with them at a corporate educational facility where they were attending week-long continuing education purchasing programs. Plant, divisional, and corporate levels of the organization were represented by the 101 persons who participated.

The decision to limit participation to members of a single organization was made to reduce error variance due to differences in organizational procedures likely to be employed by individuals coming from different firms. This has the effect of further reducing generalizability; however, a tradeoff occurs in a gain in power of the experimental design, and since the purpose is model validation rather than prediction of actual purchase behavior, this tradeoff was accepted.

Instrument Development

Vehicles used to operationalize the experimental designs are two purchasing cases developed expressly for this research. Examples of the cases are provided in Appendices 2 and 5. Different versions of the cases corresponding to experimental design treatment cells were produced

by interchanging inserts into the body of each case. That is, each subject received a case which was a combination of a section common to all subjects in all treatment conditions and an insert peculiar to the particular treatment combination the subject was being exposed to.

A preliminary version of the case employed minicomputer hardware as the object of the group vendor selection problem; however, pretesting revealed that a lack of familiarity with the rather technical evaluatory criteria employed caused considerable confusion producing unreliable vendor evaluations. For this reason the case subject was changed to bond paper copier equipment which most persons have had experience with, at least as users if not purchasers. In addition, office equipment, like a bond paper copier, constitutes a product category it was felt is most amenable to the research purpose. That is, it is non-routinized and so must be deliberated each time a purchase is contemplated. It usually is a modified rebuy or new task so that more than one person is likely to be involved.

The particulars of the purchasing cases were developed from exploratory field interviews with both users and sales representatives of bond paper copier equipment currently on the market. These interviews, conducted in Fall of 1977, provided sufficient familiarization with bond paper copiers to permit development of realistic case scenarios. These interviews, as well as reviews of trade publications, were also used to develop the attribute list subjects would base comparisons on.

In student cases subjects were first introduced to the problem which was a bottleneck in office communications flow at the fictitious Plasti-Part Corporation. Three corporate managers were introduced setting the stage for a group effort. Subjects were informed these three individuals had already conducted a preliminary investigation coming to the conclusion

that additional copiers would be needed and suggesting five salient evaluatory criteria, i.e., product features, maintenance service, delivery time, total cost and vendor reputation. Finally, the case's common portion concluded by pointing out that the field of competing vendors had been narrowed to two and all relevant information available at the time was provided in an attachment on the following page.

Manipulations of the three independent variables, information distribution, source credibility, and claim strength, were developed and selected examples are presented below. While treatment levels for information distribution and claim strength were arrived at judgmentally, information sources used to manipulate source credibility were determined in a pre-test involving 61 undergraduate students. The instrument used in that pre-test appears in Appendix 3, while the results are presented in Table 4 below.

Table 4

Summary Pre-Test Source Credibility Data

Information Source	Mean Trustworthiness	Mean Competence	Total	Rank
1. Consulting firm.	6.13	5.64	11.77	1
2. Purchasing agent, competing firm.	5.46	5.34	10.80	2
3. Purchasing agent, other industry.	4.74	6.03	10.77	3
4. Friend, user in other firm.	4.90	4.98	9.88	4
5. Friend, inside own firm.	3.93	5.79	9.72	5
6. Sales rep, longstanding association.	4.34	3.98	8.33	6
7. Sales rep, mediocre firm.	4.69	3.56	8.25	7
8. Sales rep, no prior experience, big name.	3.41	3.53	6.94	8
9. Sales rep, no prior experience, new and small.	3.10	2.92	6.02	9

While no statistical significance tests were run on differences in means it is readily apparent that meaningful differences in perceived source credibility among the sources presented do exist. Since credibility of sales representatives is of primary concern, the salesman representing the firm of long-standing and satisfactory association was chosen to operationalize the high source credibility treatment level while the salesman representing the new, small firm represents the low credibility level. Referring to Appendix 2, "Bill Williams" represents the low credibility source while "Jim Fisher" represents the high credibility source. The two non-experimental or dummy sources are "Andy Day," a friend inside the firm, and "Ray Frankel," a friend who is a user in another firm, both of which, on the basis of findings in Table 4, are moderate in source credibility being ranked fifth and fourth respectively.

Manipulation of information distribution was accomplished by varying numbers of cues supplied in the case inserts. For example, in a three-person student group two students would receive dummy inserts each containing 9 cues. These two inserts were always the same regardless of treatment cell. In the equal information distribution condition, the third student, designated the experimental subject, also received an insert with 9 cues. However, in the unequal information distribution condition the experimental subject received an insert containing 15 cues. These additional cues being in the form of warrants in the support of a claim and generally providing greater detail. Differences are illustrated by underlined cues in the following paragraphs excerpted from equal and unequal information distribution inserts respectively.

> Our copy quality is <u>good</u>, in fact, in blind tests some people have been <u>unable to distinguish</u> between our copies and the originals

> they were made from. The machine is well built and easy to operate.
>
> Our copy quality is good, in fact, in blind tests some people have been unable to distinguish between our copies and the originals they were made from. This is due to a newly patented process that uses a photo cell just like in expensive cameras to precisely meter exposure time. The machine is well built and subjected to exhaustive quality control checks before you get it. We have engineered it specially to make it easy to operate and refill with paper.

Finally, the claim strength or language intensity factor was manipulated by modifier polarity. Referring again to the first paragraph above as an example of the moderate claim strength condition, the contrast with the strong claim strength condition is apparent by focusing on underlined portions.

> Our copy quality is good, in fact, in blind tests some people have been unable to distinguish between our copies and the originals they were made from. The machine is well built and easy to operate.
>
> Our copy quality is excellent, in fact, in blind tests most people have been unable to distinguish between our copies and the originals they were made from. The machine is exceptionally well built and we have taken particular care to make the machine easy to operate.

Differences of this type were carried out throughout the experimental inserts with attention being given not to alter the number of cues, as this would confound interpretation of the information distribution factor.

A four-part questionnaire is attached to each student's case, a copy of which appears in Appendix 4. Part I consists of 14 items designed to probe vendor preferences and behavioral intent. More specifically items 1-5 request specific attribute vendor evaluations, items 6 and 7 are measures of overall attitude toward vendor (A_o), items 8 and 9 measure behavioral intent (BI) and items 10-14 require saliency

responses regarding the five attributes in items 1-5. Although not the primary aim of the investigation, collection of this type of data permits explorations in multi-attribute decision models of expectancy-value type.

Part II consisted of a battery of eight items that are manipulation checks, that is, measures of the extent to which application of the treatments had the desired cognitive effects. Their principal value come as diagnostic aids should the findings be other than what the model predicts. These are followed by a three-item scale which takes the first dependent construct measure, specific self-confidence. Multiple item scales are used for dependent constructs to permit discussion of instrument reliability. These scales were developed through factor analysis of the 1977 minicomputer case pre-test data. Inclusion criteria were post-varimax rotation unifactor loadings of 0.40 or higher.

Part III replicates Part I exactly and is administered after group discussion to measure discussion induced changes in attitudes and intent. Part IV begins with a five-item scale to measure perceived advocacy, another dependent construct. The remaining items, 45-50, are sociometric correlates of communicator influence and are not utilized in the current investigation.

Measures employed in items 1-8, 26-33, and 40-50 are Guilford Constant Sum Scales, which have been used primarily for two reasons. In the Summer 1977 pre-test, Likert items were used to measure these characteristics and examination of the data seemed to indicate that student subjects were not actually comparing vendors as had been intended. That is, they seemed to examine each in isolation, often coming up with near identical ratings. Introduction of Guilford scales forces cognitive comparisons while still permitting an identical rating

on an attribute if that is what the respondent really intends. The second factor motivating choice of the Guilford scale was the fact that it produces data of interval level of measure whereas, technically, the Likert scale does not. In some instances this matter would not be of great concern; however, the ANOVA model's validity rests on assumptions of homogeneity of within-treatment variance and, in the case of repeated measures, homogeneity of between treatment co-variances. Therefore, ability to compute meaningful variance and co-variance terms is of great importance.

Turning to the case employed with business practitioners, several similarities and differences are noteworthy. The most important is that information provided in the experimental inserts to compare vendors is numeric rather than verbal. This change was made possible by elimination of the claim strength factor from the experimental design, and came about as a result of feedback from exploratory interviews conducted Fall 1977 which indicated that the student case might be viewed as excessively artificial by practitioners.

One attributed source of information, the fictitious Buyers Services Inc., is a derivative of an actual firm, Buyers Laboratories Inc., which provides tabular comparisons of this type based on survey data from users of copier equipment. In fact, several of the attribute ratings are actual ones from competing products rated by Buyers Labs.

The common portion of the case was rewritten into two versions, one involving a convenience walk-up copier selection decision and the other a central reproduction facility choice. Two versions were necessitated by the repeated measures design, otherwise the second would always be trivial. Also the body of the case was shortened as two complete replications of the experiment with each group are required and

practitioners typically face more strenuous demands on their time than do students.

Examining copies of the cases in Appendix 5, one sees that manipulation of information distribution once again is accomplished by altering the number of cues presented going from 8 in the equal conditions to 12 in the unequal condition. This compares with the 9 and 15 respectively found in the student cases.

Inasmuch as purchasing managers actually do utilize the services of firms like Buyers Laboratories and Data-Pro to assist them in making evaluations, and in view of the rankings in Table 4, the independent and well-respected Buyers Services Inc. represents the high source credibility condition, while the relatively little known Mr. Frank Cassady representing a vendor new to the bond paper copier business operationalizes the low credibility condition.

The questionnaire, reproduced in Appendix 6, remains virtually identical to that used with the student subjects with the exception that the delivery time attribute is replaced by additional product features, the manipulation check items referring to vendor A are removed from Part II, and the sociometric measures are removed from Part IV. These changes were made to shorten the instrument and cut down on administration time and because interviews with persons knowledgable in the copier market indicated that delivery dates are seldom a problem whereas vendor differences in special features like automatic duplexing might be a worthwhile point of comparison.

Instrument Administration Procedure

A principal criticism of much of social psychological investigation into group processes is that often there exists no group at all. That

is, subjects often consist of students who are brought together on the day of the experiment, perhaps never having met before, interact for an hour or so and go their separate ways. Reference group theory indicates that group cohesiveness is a function of the desire of members to remain part of the group and that norm formation and conformity pressure are in turn functions of cohesiveness. It can be seen then that experiments frequently are conducted with temporary aggregations of individuals, not true groups. As a result behaviors elicited and conclusions drawn are not characteristic of actual groups in natural settings.

To a certain extent all laboratory investigation is similarly suspect; however, in this research, procedures for administration of the experiments, with both students and practitioners, include steps taken specifically to partially resolve this problem.

The student participants who volunteered in any one term all came from the same academic course. At the term's beginning, volunteers were assigned to or allowed to self-select three-person groups. These groups remained intact throughout the ten-week term. Each team completed two written case analyses, receiving a team grade, prior to administration of the experimental case. Thus, group members not only were provided an opportunity to establish norms, they also had a vested interest in the quality of group output.

As was mentioned earlier several practitioner groups were wholly natural, functioning as a group on a day-to-day basis. These teams ranged in size from two to eight and from very informal associations to a formal buying committee. The predominant arrangement, however, was an office services manager with a staff assistant who usually was more technically aware and took care of day-to-day concerns. A total of eight

of these natural groups completed the experiment, seven of which were two person and one of which was three person.

In view of the fact that the two-person group was most common, the buyers and assistant buyers enrolled in purchasing seminars were arranged into two-person groups. Of all of the participants in the study, these individuals' groups were least natural as the seminars were three days long and they had worked together as partners only once before.

Randomization procedures were employed with both students and practitioners as group assignment to treatment condition and selection of experimental subjects within groups were accomplished with the aid of random number tables.

On the day of the experiment participants were assembled and told that the purpose of the case and its accompanying questionnaire was two-fold. First the case was being developed for use in continuing education seminars and second, baseline data was being collected to determine "the right answer." Cases were then passed out and instructions for completing the questionnaire reviewed. The instructions stressed several points, namely,

> Subjects should complete Parts I and II before discussion and go to Parts III and IV only after discussion,
>
> Subjects should respond to all questionnaire items individually without consulting each other, especially in Part IV,
>
> Subjects should discuss the case until a consensus vendor choice was reached and do so quietly so as not to disturb other groups in the same room,
>
> Subjects should respond to the cases and make a choice based only on the information provided even if that information was incomplete in their opinion.

The experiment typically took about one hour to complete of which approximately 15-20 minutes was actually devoted to group discussion. Following collection of the cases subjects were debriefed. On questioning it was readily apparent that most had ascertained that some dimensions of group leadership were being investigated; however, none expressed any awareness of the true purposes or methods of manipulation. These were explained during the concluding portion of the debriefing.

Data Analysis

Questionnaires used for data collection appear in Appendices 4 and 6. Initially each item is treated as a separate variable and coded, along with independent factors and subject identification sequences, into a distinct field on a case record. Two alternatives exist for analysis of group level data from the student sample. These are multivariate analysis of variance on scores pooled over group members but not scale items versus univariate analysis of variance of scores pooled over group members and scale items. As an example, considering items 40-44 in Part IV of the student questionnaire in Appendix 4 the mathematical model describing the evaluation score of one person on one item is,

$$Y_{ijkl} = \mu + \alpha_i + \beta_j + \gamma_k + \alpha\beta_{ij} + \alpha\gamma_{ik} + \alpha\gamma_{jk} + \alpha\beta\gamma_{ijk} + \epsilon_{ijkl} \quad \{8\}$$

which is the same as equation {4} presented above. Disregarding for a moment the subscripts denoting factor levels, i.e., i, j, k, let us denote member evaluations on items by,

$$Y = \mu_{lm} + \alpha_{lm} + \ldots + \epsilon_{lm} \quad \{9\}$$

where l designates group members and m individual questionnaire items. Performance of multivariate analysis of variance necessitates forming a data matrix pooled over the two dummy group members yet retaining

individual item identity, that is, submission of a $Y_{.m}$ score for each group-item combination. On the other hand, univariate analysis of variance may be performed on the scale total score by pooling over both group members and items so that for each group a single $Y_{..}$ score is input.

When possible the multivariate analysis of variance (MANOVA) procedure is clearly indicated in studies involving multiple correlated dependent variables.[6] MANOVA first tests for the significance of treatment effects on the entire set of items comprising the scale and if significance is found identifies the item(s) principally responsible for that significance. A side benefit to the use of MANOVA lies in the fact that significance may be obtained from analysis of the complete variable set even when univariate analyses of the separate items in the set do not produce significance.

Use of MANOVA is limited to data obtained from students as software to perform the analysis on data from a repeated measures experiment was not available. Thus significance testing with the practitioner data is obtained by performing univariate ANOVAs on scale totals.

In addition to significance testing for presence of an effect, supplementary analyses are performed to measure the strength of relationship between independent and dependent variables. That is, a reported alpha level is sometimes erroneously interpreted as a measure of strength of association.[7] A more appropriate method is to report $\hat{\omega}^2$ (omega squared), a statistic discussed by Hays.[8] This index isolates the proportion of variability in the population total variance attributable to a particular treatment effect, much as a partial β^2 might in the regression model. Use of omega squared in conjunction with the usual F-test for significance is especially recommended when investigation is being

undertaken in a new and uncharted area. The general form of the equation for omega squared is given by,[9]

$$\hat{\omega}^2_{effect} = \hat{\sigma}^2_{effect} / \hat{\sigma}^2_{effect} + \hat{\sigma}^2_{wg}. \quad \{10\}$$

Finally, the ability of a particular experiment to demonstrate the existence of significant treatment effects when they do in fact exist is functionally dependent on the power of that experiment. That is, the more powerful the experiment the greater its sensitivity to treatment effects. The power of an experiment is a function of four factors, namely,

- Alpha level, selection of a numerically higher alpha, moving from .05 to .10 for example, results in an increase in power,
- Replications, the larger the number of observations on each treatment condition the greater the power,
- Error variance, power is reduced as variance attributable to any source other than the treatments increases,
- Treatment effect magnitude, the larger the treatment effect the more powerful the experiment.

Common practice involves first establishing an acceptable alpha level for significance testing and then taking whatever steps possible to increase power. In the present investigation this involved use of the repeated measures design with the practitioners which has the effect of reducing variation due to individual differences, as well as selecting all practitioner subjects from a single firm to reduce variance attributable to organizational policy differences. In both student and practitioner cases manipulation of treatment levels were realistic in terms of what one actually finds in the marketplace. Exaggerating differences between treatment levels will have the result of enlarging

treatment effects and thus increasing power, however, at the price of making interpretation nonsensical. The chief benefit of a priori power determination is a check to see whether the experiment is likely to produce significant results; however, to do so requires a priori knowledge or estimates of treatment effects. Post-hoc power determination is useful in diagnosing problems should results be found not significant at a given alpha level.

All dependent constructs in both student and practitioner data bases are subjected to significance tests for main and interaction treatment effects. Determination of omega squared and power is performed selectively as interpretive requirements warrant. In addition, partial correlations among the dependent constructs are performed to provide validating evidence concerning the serial relationships posited in the model, e.g., between specific self-confidence and perceived advocacy behavior and between perceived advocacy behavior and post-discussion group vendor evaluation.

References

1. Campbell, J. C. and D. T. Stanley, Experimental and Quasi-Experimental Designs for Research, Chicago: Rand McNally (1966).

2. Theoretical derivation of the general models and discussion of the terms in the summary ANOVA tables may be found in any of several standard texts including: Keppel, G., Design and Analysis: A Researcher's Handbook, Englewood Cliffs, N.J.: Prentice Hall Inc. (1973) or W. L. Hays, Statistics for the Social Sciences, edition, New York: Holt, Rinehart and Winston Inc. (1973).

3. Keppel, G., op.cit., 423.

4. Ibid., 439.

5. Ibid., 462-4.

6. Finn, Jeremy, A General Model for Multivariate Analysis, New York: Holt, Rinehart and Winston (1974), 210 and ff.

7. Keppel, op.cit., 548.

8. Hays, op.cit., 512-14.

9. Keppel, op.cit., 553.

Chapter V

RESEARCH RESULTS

The working hypotheses presented in Chapter 3 provide a framework for discussion of research findings. Each hypothesis was tested on samples drawn from two distinct populations, students and practitioners. In this chapter, consideration is first given to results from the student sample for all working hypotheses followed by discussion of practitioner sample results.

Student Sample

As indicated in Chapter 4, appropriate first analysis is multi-variate analysis of variance. The analysis sequence first tests the highest order interaction, in this case three way, and subsequently tests lower order interactions and finally main effects. This procedure presumes that the sequence is terminated at the highest order interaction found significant. In the case of no significant interactions, interaction degrees of freedom and variance are collapsed into the main effects error term used to determine main effects F-statistics.

The MANOVA summary tables which follow present an overall F-statistic for the scale measuring a particular dependent variable. Corresponding F's for individual scale items are also presented when significant. In the multi-variate case the calculated F-statistic is that of Wilks.

Note that test results for several working hypotheses are presented in each summary table and that order of presentation differs somewhat from that in Chapter 3. For example, Table 5 considers the dependent variable specific self-confidence which is measured by items 23, 24 and

25 on the instrument in Appendix 4. The working hypotheses summarized are H^{o}_{IV23}, H^{o}_{IV16}, H^{o}_{IV9}, H^{o}_{IV2}, H^{o}_{IIIa2}, H^{o}_{IIa2}, and H^{o}_{Ia2}. Only those hypotheses relevant to dependent variables specifically identified in the causal model, Figure 6, are discussed in the body of this chapter, while the other hypotheses are presented in Appendix 7.

Table 5

Student Sample Specific Self-confidence (Y_{SSC}) MANOVA

Effect	d.f.	F	Significance Level
ID x SC x CI	3,54	.299	.83
Overall	3,54	.299	.83
ID x SC			
Overall	3,54	1.105	.35
ID x CI			
Overall	3,54	1.996	.13
Item 23	1,56	2.745	.10*
Item 24	1,56	1.893	.17
Item 25	1,56	5.463	.02*
SC x CI			
Overall	3,54	.915	.44
Item 23	1,56	.877	.35
Item 24	1,56	2.774	.10*
Item 25	1,56	1.366	.25
ID			
Overall	3,54	.958	.51**
SC			
Overall	3,54	.508	.68**
CI			
Overall	3,54	.969	.64**

*Effect statistically significant at $p \leq .10$
**Effect not interpretable due to presence of higher order interaction

The direct effects of factors and their interactions on each of the dependent variables is considered first followed by consideration of relationships among the dependent variable set.

The figures in Table 5 suggest that while there is no significant three-way interaction, weak evidence supporting separate two-way interactions between information distribution and claim intensity and between source credibility and claim intensity does exist. These results are supportive of the initial link in the model.

Table 6 summarizes the tests for hypotheses H^{o}_{IV27}, H^{o}_{IV20}, H^{o}_{IV13}, H^{o}_{IV6}, H^{o}_{IIIb3}, H^{o}_{IIb3}, and H^{o}_{Ib3}. These hypotheses relate to the direct effect of independent factors and their interactions on the dependent variable peer evaluations of advocacy behavior. This construct is measured by means of a five-item scale consisting of items 101-105 on the instrument in Appendix 4.

Table 6

Student Sample Perceived Advocacy (Y_{PA}) MANOVA

Effect	d.f.	F	Significance Level
IC x SC x CI			
Overall	5,52	.105	.99
ID x SC			
Overall	5,52	1.598	.18
ID x CI			
Overall	5,52	.481	.79
SC x CI			
Overall	5,52	1.217	.31
ID			
Overall	5,52	.988	.43
Item 101	1,56	.636	.43
Item 102	1,56	.940	.34
Item 103	1,56	.156	.69
Item 104	1,56	4.423	.04*
Item 105	1,56	.975	.33

Table 6 (cont'd.)

Effect	d.f.	F	Significance Level
SC			
Overall	5,52	1.766	.13
Item 101	1,56	2.195	.14
Item 102	1,56	.151	.70
Item 103	1,56	2.489	.12
Item 104	1,56	6.177	.02*
Item 105	1,56	.244	.62
CI			
Overall	5,52	.324	.90

*Effect statistically significant at $p \leq .10$

Based on this data there appears to be little evidence supporting direct linkages between the factors and perceived advocacy. This is not unexpected as the model does not postulate any such linkages. A significant main effect for information distribution and source credibility is encountered with item 104 in the perceived advocacy scale which measures persuasiveness specifically. While these effects cannot be dismissed as spurious, evidence of relationship is once again quite weak, as it was detected by only a single item in the scale.

Once again referring to the causal model in Figure 6 direct relationships between factors and the next two dependent variables, i.e., post-discussion vendor evaluation and post-discussion behavioral intent, are tested by means of hypotheses H^{o}_{Ib1}, H^{o}_{Ib2}, H^{o}_{IIb1}, H^{o}_{IIb2}, H^{o}_{IIIb1}, H^{o}_{IIIb1}, H^{o}_{IIIb2}, H^{o}_{IV4}, H^{o}_{IV5}, H^{o}_{IV11}, H^{o}_{IV12}, H^{o}_{IV18}, H^{o}_{IV19}, H^{o}_{IV25}, H^{o}_{IV26}.

Post-discussion vendor evaluation is measured by a two-item scale, items 31 and 32, while post-discussion behavioral intent is measured by item 33 in Appendix 4.

Examining Tables 7 and 8 a significant relationship between source credibility and post-discussion vendor evaluation and post-discussion

behavioral intent is observed. The significant main effect for source credibility is evident with perceived advocacy, vendor evaluation and behavioral intent. None of these is postulated in the model and their implications are taken up in the concluding chapter; however, relationships with the other two factors are not evidenced which is in accordance with the model.

Table 7

Student Sample Vendor Evaluation (Y_{VE}) MANOVA

Effect	d.f.	F	Significance Level
ID x SC x CI			
Overall	2,55	.255	.78
ID x SC			
Overall	2,55	.272	.76
ID x CI			
Overall	2,55	.039	.96
SC x CI			
Overall	2,55	.406	.67
ID			
Overall	2,55	1.334	.27
SC			
Overall	2,55	2.448	.10*
Item 31	1,56	2.185	.15
Item 32		4,268	.04*
CI			
Overall	2,55	.017	.98

*Effect statistically significant at $p \leq .10$

Table 8

Student Sample Behavioral Intent (Y_{BI}) ANOVA

Effect	d.f.	F	Significance Level
ID x SC x CI	1,56	1.841	.18
ID x SC	1,56	.003	.96
ID x CI	1,56	.002	.96
SC x CI	1,56	1.299	.26
ID	1,56	.003	.96
SC	1,56	3.207	.08*
CI	1,56	1.299	.26

*Effect statistically significant at $p \leq .10$

To this point hypotheses have been tested by means of MANOVA as outlined earlier. The alternative procedure, to sum the scale item scores into a scale total or index, will now be considered. In order to perform ANOVA on these totals meaningfully it is first necessary to demonstrate scale homogeneity. This is typically done by means of a reliability coefficient. The purpose of the multiple item scale is two-fold. First, to improve the quality and stability of measurement and second, to permit specification of measurement error. The topic of reliability and measurement error is given extensive coverage in a recent special issue of the Journal of Marketing Research.[2]

As mentioned above, the presence and extent of measurement error is measured by means of Cronbach's alpha reliability coefficient. The square root of this coefficient is, by definition, the correlation between fallible measurements or observations and the error-free latent or true scores they approximate. Clearly the greater the amount of measurement error present the lower the reliability coefficient and hence the true score correlation. As Nunnally states,

> All these considerations justify the statement that coefficient alpha is a very important formula in the theory of reliability.

> It represents the expected correlation of one test with an alternative form containing the same number of items. The square root of coefficient alpha is the estimated correlation of a test with errorless true scores. It is so pregnant with meaning that it should routinely be applied to all new tests.[3]

Coefficient alpha and its square root are presented below for each of the dependent variable scales utilized with the student sample data. Note that the scale for vendor evaluation is only two items. The SPSS sub-routine used to calculate coefficient alpha requires scales having a minimum of three items. To circumvent this problem item 8, the pre-discussion behavioral intent measure, was included along with items 6 and 7 for the purpose of the original calculation. However, the reported coefficient is that which results when item 8 is deleted from the scale.

Table 9

Student Sample Dependent Scale Reliability Coefficients

Scale	Items	α	$\sqrt{\alpha}$
Specific Self-confidence (Y_{SSC})	23,24,25	.819	.905
Perceived Advocacy (Y_{PA})	40 to 44	.727	.853
Vendor Evaluation (Y_{VE})	6,7	.677	.823

These coefficients were determined from the responses of the "dummy" subject(s) in each group collapsed over all cells in the experimental design. In addition, for the vendor evaluation scale, pre-rather than post-discussion items were utilized. Both of these steps were undertaken to eliminate possible confounding in the interpretation of coefficient alpha had experimental subject data been utilized and treatment by item interactions present. In examining the greatly different F-statistics for the various items in the scales presented in Tables 5

through 7 it appears that treatment by item interactions may exist.

In view of the relatively encouraging values obtained for coefficient alpha it is appropriate to combine the scale items into an index for each scale and repeat the analyses. The combinatorial method employed was to simply sum the item scores into a scale total score.

Table 10

Student Sample Specific Self-confidence Scale Total (Y_{SSCTOT}) ANOVA

Effect	d.f.	Mean Square	F	Significance
ID x SC x CI	1	9.766	.485	.49
SC x CI	1	28.891	1.435	.24
ID x CI	1	66.016	3.280	.08*
ID x SC	1	.766	.038	.85
CI	1	4.516	.224	.638**
SC	1	3.516	.175	.678
ID	1	19.141	.951	.334**
Residual	56	20.127		

*Statistically significant at $p \leq .10$
**Not interpretable due to presence of higher order interaction

Comparing the results in Table 10 with those in Table 5, presence of the information distribution by claim intensity interaction effect is supported while the source credibility by claim intensity interaction is not.

Table 6 and 7 suggested the presence of significant main effects for information distribution and source credibility with perceived advocacy (Y_{PA}) and source credibility with vendor evaluation (Y_{VE}) respectively. However, the model postulates serial causation among specific self-confidence, perceived advocacy, and vendor choice with no direct linkages between the independent factors and either perceived advocacy or vendor evaluation.

The following tables, 11 and 12, based on the scale total scores

support the existence of a source credibility main effect in both cases however.

Table 11

Student Sample Perceived Advocacy Scale Total (Y_{PATOT}) ANOVA

Effect	d.f.	Mean Square	F	Significance
ID x SC x CI	1	1.723	.302	.59
SC x CI	1	3.574	.658	.42
ID x CI	1	6.566	1.152	.29
ID x SC	1	1.129	.198	.66
CI	1	.879	.154	.70
SC	1	16.504	2.895	.09*
ID	1	11.816	2.073	.16
Residual	56	5.74		
	63			

*Statistically significant at $p \leq .10$

Table 12

Student Sample Vendor Evaluation Scale Total (Y_{VETOT}) ANOVA

Effect	d.f.	Mean Square	F	Significance
ID x SC x CI	1	1.891	.216	.64
SC x CI	1	6.891	.789	.38
ID x CI	1	.391	.045	.83
ID x SC	1	4.561	.517	.48
CI	1	.016	.002	.97
SC	1	28.891	3.308	.07*
ID	1	.391	.045	.83
Residual	56	8.734		
	63			

*Statistically significant at $p \leq .10$

To determine relationships among the dependent variables partial correlation and contingency analysis were performed. Partial correlation was performed on scale totals while the contingency analysis was performed on individual items in the advocacy scale.

Table 13 below summarizes both zero-order and partial correlation coefficients among the three dependent variable scales.

Table 13

Student Sample Scale Total Dependent Variable Relationships

Linkage	Correlation Coefficient	N	Significance
$Y_{SSCTOT} - Y_{PATOT}$ (zero order)	-.023	62	.43
$Y_{SSCTOT} - Y_{VETOT}$ (zero order)	-.222	62	.04*
$Y_{PATOT} - Y_{VETOT}$ (zero order)	-.005	62	.48
$Y_{SSCTOT} - Y_{VETOT}$ (Y_{PATOT} partialed)	-.222	61	.04*
$Y_{PATOT} - Y_{VETOT}$ (Y_{SSCTOT} partialed)	-.011	61	.47

*Statistically significant at $p \leq .10$

These results indicate that by and large no relationships exist among the dependent variables. However, the negative relationship between pre-discussion specific self-confidence and post-discussion vendor evaluation warrants comment. The negative sign on the coefficient is due to the manner in which data were coded for analysis. Recall that since a constant sum scale was employed only the respondents' evaluations of the first of the two vendors was coded. The negative coefficient indicates an inverse relationship between specific self-confidence and evaluation of the first of the two vendors. This implies a positive relationship between specific self-confidence and evaluation of the second vendor. This is true because of the characteristics of a constant sum scale.

To provide another measure of the relationship between perceived advocacy and vendor choice a contingency analysis of these two variables was undertaken. Pre- versus post-discussion vendor choice is compared

against perceived advocacy (Y_{PA}). Instances in which post-discussion group choice agrees with pre-discussion experimental subject choice are coded "agree" while disagreement is coded "disagree." Correspondingly perceived advocacy scores, i.e., scores of 4-8 out of a possible 8 are coded "high" while scores between 1 and 3 are coded "low." This imbalance results from use of modal scores to determine the recode categories, i.e., evaluation of three persons by means of a ten-point constant sum scale very frequently resulted in a 3,3,4 type of pattern, therefore, any value of 4 or higher is coded as a "high" score. Each item in the perceived advocacy scale was tested separately to prevent washing out any weak yet significant relationship which may exist.

Table 14

Student Sample Vendor Choice with Perceived Advocacy

Item	Chi-square	Significance
101	.712	.40
102	.681	.41
103	2.213	.14
104	.090	.76
105	3.064	.08*

*Statistically significant at $p \leq .10$

For Item 105:

		Pre-, Post-discussion Choice		
		Agree	Disagree	
Argument Strength Score	Low	16	16	32
	High	15	4	19
		31	20	51

Phi = Eta = .287

The numerically low frequency in the bottom right-hand cell indicates there were significantly fewer instances in which the experimental subject received a high rating on strength of argument and post-discussion vendor choice was different from his pre-discussion choice. This finding is in agreement with what one would expect to find based on the model.

Consideration of the implications of the student sample results is taken up in the concluding chapter; however, to briefly summarize the validation phase data:

- Complete validation of the entire model was not obtained,
- Several of the individual linkages in the model were validated on either individual items in the dependent variable scales or, in some instances, on the entire scale,
- Several additional relationships, not postulated in the original form of the model, appear to warrant further investigation.

Before proceeding to the practitioner sample data, Table 11 summarizes those relationships found significant. Hays' omega squared is included to facilitate comparisons of relative strength of relationship. Figures 9-12 illustrate the four interactions summarized in Table 15.

Table 15

Summary of Student Sample Significant Relationships

Relationship	Statistic	Value	Significance	W^2
ID x CI with Y_{SSC} (Item 23)	F	2.745	.10	.03
ID x CI with Y_{SSC} (Item 25)	F	5.463	.02	.07
ID x CI with Y_{SSCTOT}	F	3.280	.08	.03
SC x CI with Y_{SSC} (Item 24)	F	2.774	.10	.03

Table 15 (cont'd.)

Relationship	Statistic	Value	Significance	ω^2
ID with Y_{PA} (Item 104)	F	4.423	.04	.05
SC with Y_{PA} (Item 104)	F	6.177	.02	.07
SC with Y_{PATOT}	F	2.895	.09	.03
SC with Y_{VE} (Item 32)	F	4.268	.04	.05
SC with Y_{VETOT}	F	3.308	.07	.03
SC with Y_{VI} (Item 33)	F	3.207	.08	.03
Y_{SSCTOT} with Y_{VETOT}	F	3.115	.08	.03
Y_{SSCTOT} with Y_{VETOT}	r	- .222	.04	
Pre-, post-discussion vendor choice with Y_{PA} (Item 105)	χ^2	3.064	.08	

Practitioner Sample

Replication of the experiment with subjects drawn from a practitioner population provides an opportunity to verify and further explain those relationships uncovered with the student subjects. It also provides another chance to specify relationships in the event that an unforeseen student by treatment interaction were present. This second question is relevant to the issue of the appropriateness of student subjects in business research. As with the student sample results summarizing hypothesis tests concerning independent factor-dependent variable relationships are taken up prior to consideration of dependent variable-dependent variable relationships. First, however, reliability analysis demonstrates homogeneity of dependent variable scale content domains.

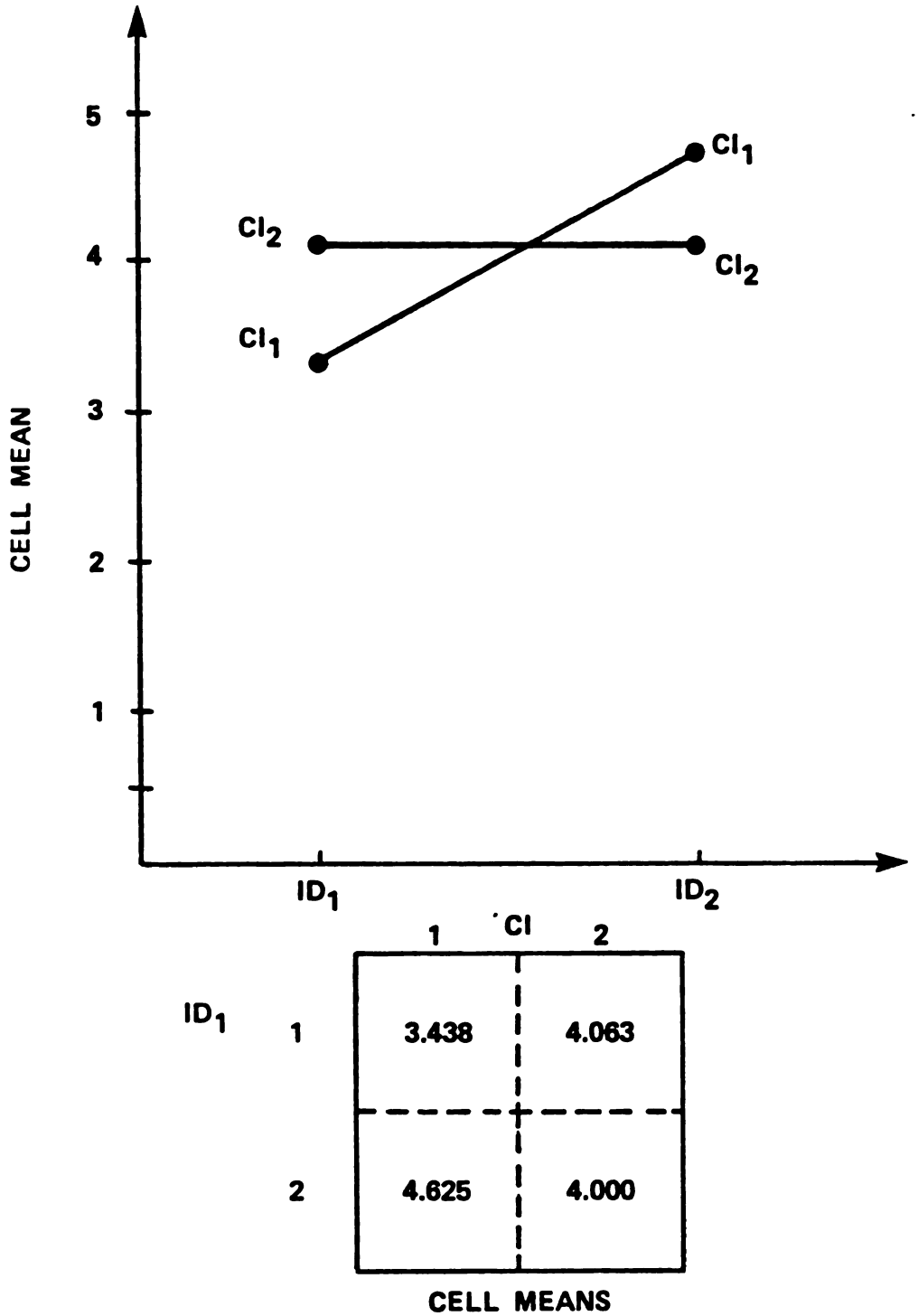
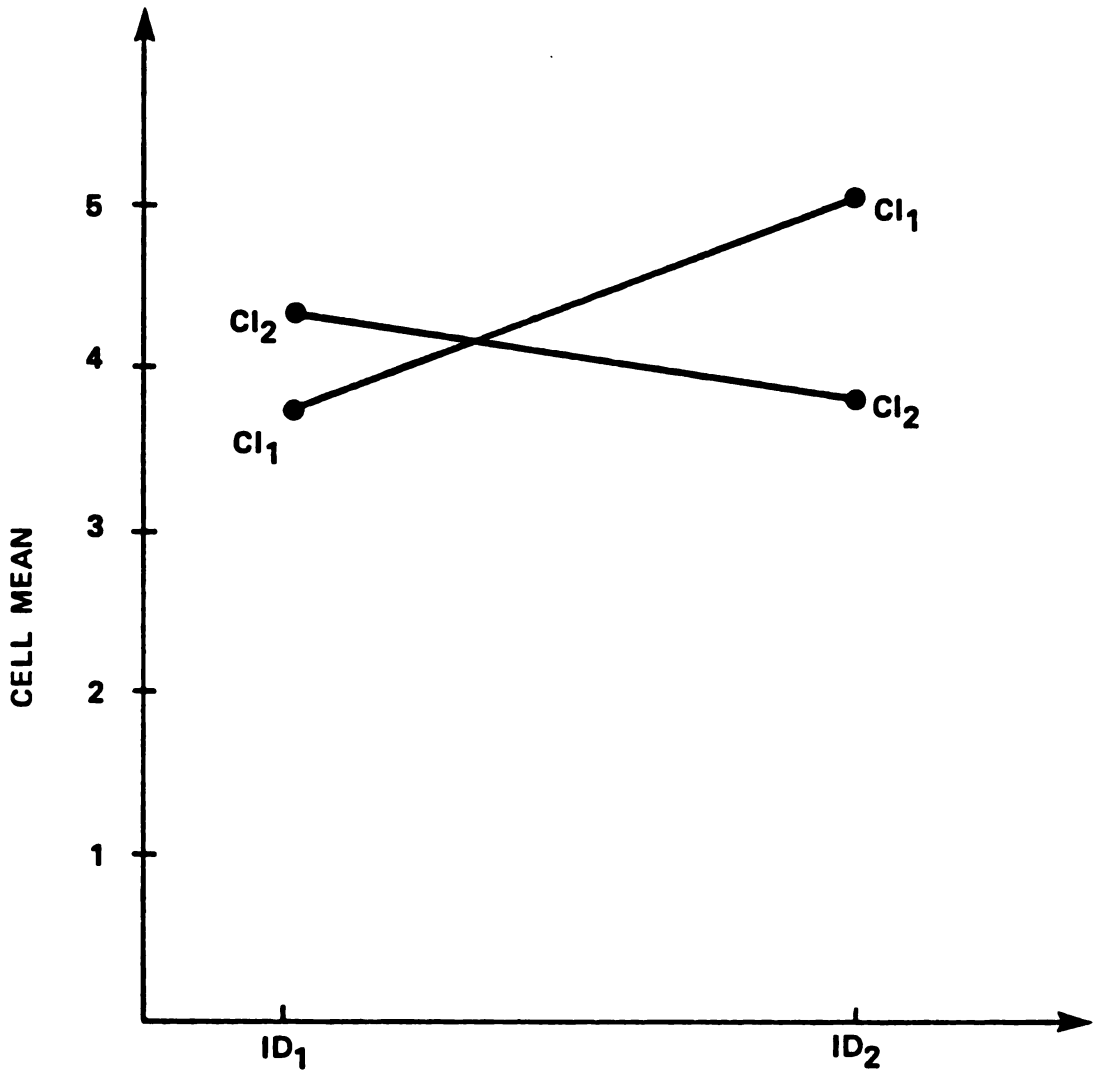


FIGURE 9 – INFORMATION DISTRIBUTION BY CLAIM INTENSITY INTERACTION EFFECT ON Y_{SSC} (ITEM 23).



ID_1	1 (CI)	2 (CI)
1	3.750	4.313
2	5.000	3.750

CELL MEANS

FIGURE 10 – INFORMATION DISTRIBUTION BY CLAIM INTENSITY INTERACTION EFFECT ON Y_{SSC} (ITEM 25).

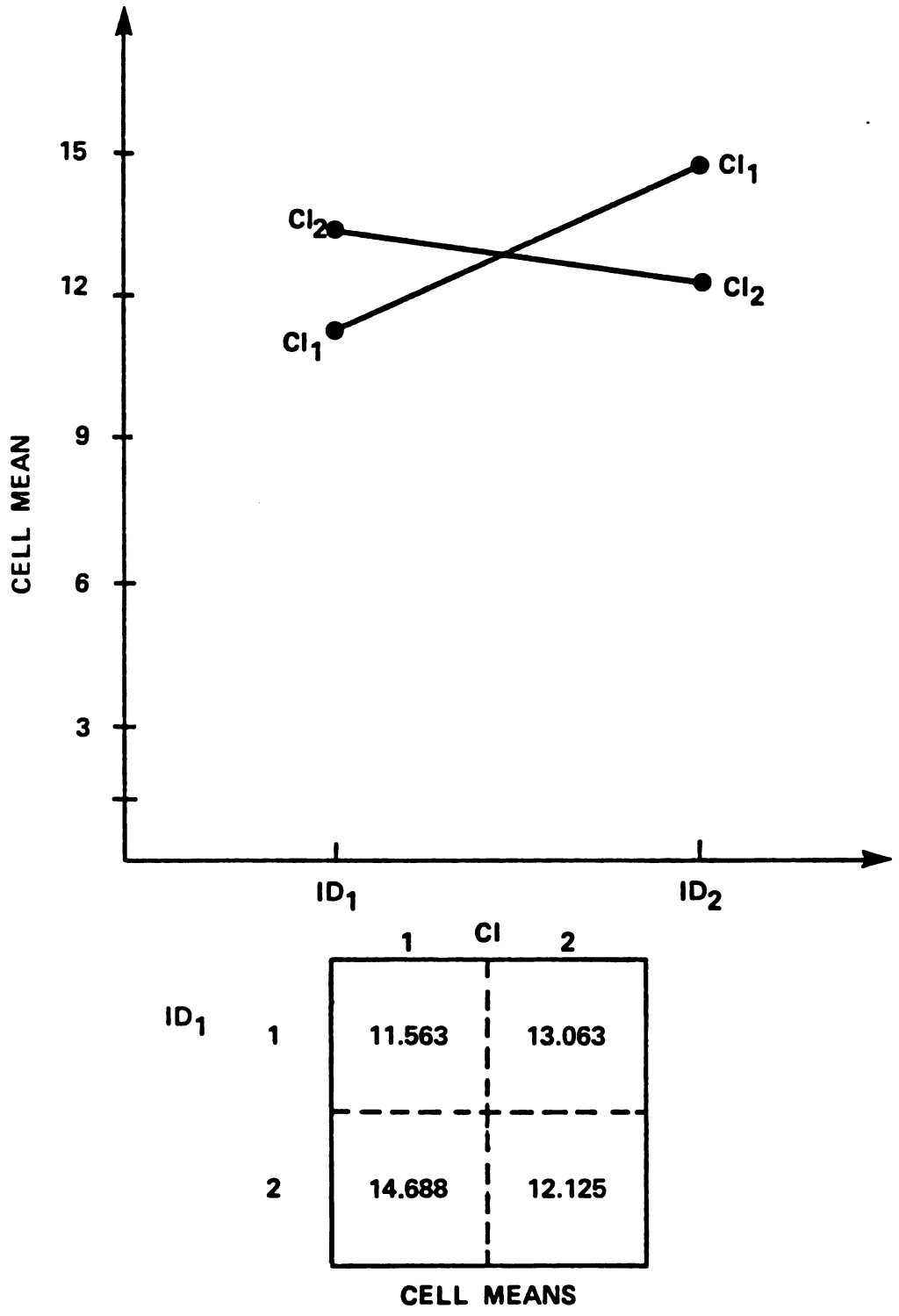
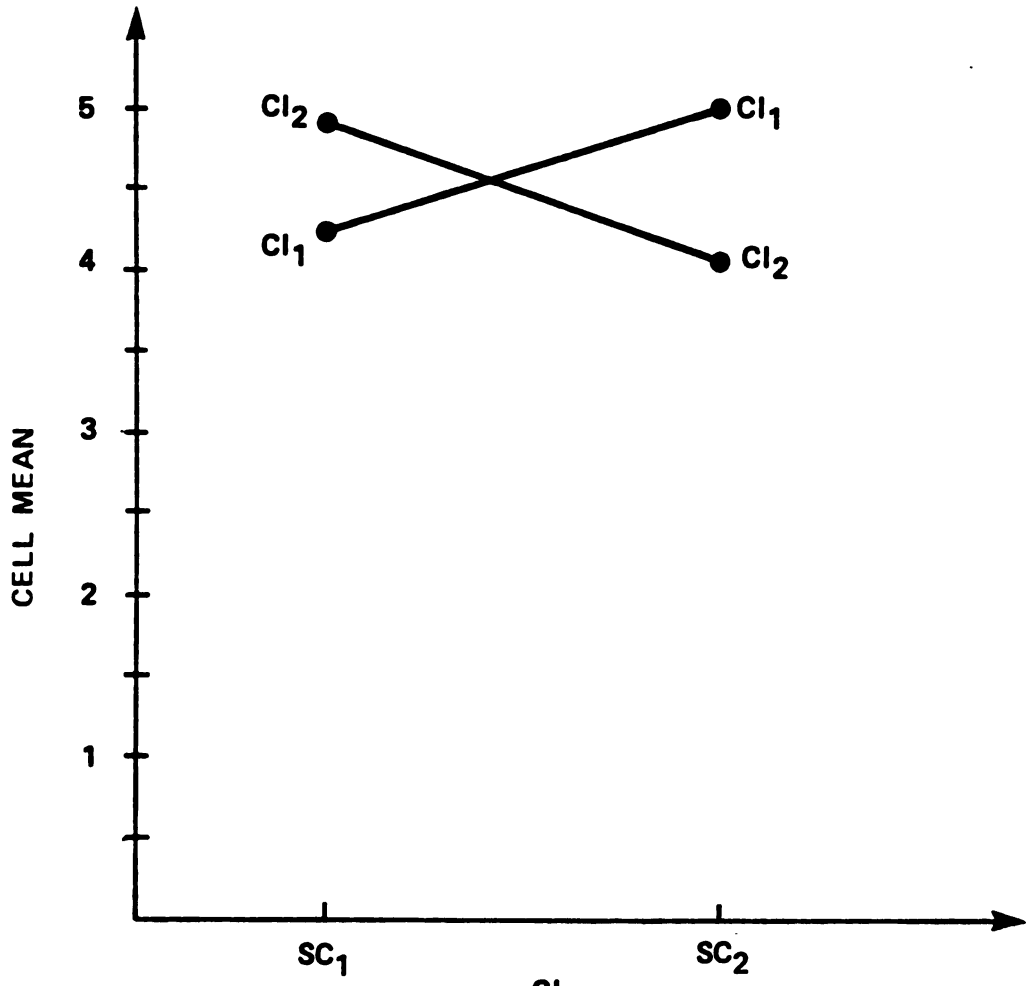


FIGURE 11 – INFORMATION DISTRIBUTION BY CLAIM INTENSITY INTERACTION EFFECT ON Y_{SSC} (SCALE TOTAL).



ID_1	CI 1	CI 2
1	4.4375	4.8750
2	5.000	4.1875

CELL MEANS

FIGURE 12 – SOURCE CREDIBILITY BY CLAIM INTENSITY INTERACTION EFFECT ON Y_{SSC} (ITEM 24).

Table 16

Practitioner Sample Dependent Variable Scale Reliability Coefficients

Scale	Items	α	$\sqrt{\alpha}$
Specific Self-confidence	19,20,21	.899	.948
Perceived Advocacy	41 to 45	.829	.910
Vendor Evaluation	6,7	.862	.928

Table 17

Practitioner Sample Specific Self-confidence (CONSCALE) ANOVA

Effect	SS	d.f.	MS	F	Significance
Specific Self-confidence, Scale Total:					
ID	136.298	1	136.298	7.821	<.01*
S/ID	697.108	40	17.428		
SC	56.679	1	56.679	4.017	<.06*
ID x SC	.298	1	.298	.021	N.S.
SC x S/ID	564.381	40	14.110		
		83			
ID	10.715	1	10.715	7.252	<.01*
S/ID	59.095	40	1.477		
SC	9.334	1	9.334	8.012	<.01*
ID x SC	.047	1	.047	.040	N.S.
SC x S/ID	46.619	40	1.165		
		83			
ID	16.298	1	16.298	8.286	<.01*
S/ID	78.667	40	1.967		
SC	5.250	1	5.250	4.070	<.05*
ID x SC	.583	1	.583	.452	N.S.
SC x S/ID	51.619	40	1.290		
		83			
ID	19.048	1	19.048	20.704	<.001*
S/ID	36.786	40	.920		
SC	4.762	1	4.762	1.729	<.25
ID x SC	0.000	1	0.000	0	N.S.
SC x S/ID	110.262	40	1.290		
		83			

*Statistically significant at $p \leq .10$

The relationships between information distribution, source credibility and pre-discussion specific self-confidence would not appear quite clear. The lack of an information distribution by source credibility interaction can be expected as none was found with the student subjects either. It was of course not possible to examine any effects due to claim intensity as this factor was not included in the practitioner design.

Possible explanations for the occurrence of a significant main effect for information distribution with the practitioners but not with the students are suggested by the differences in designs. That is,

- the repeated measures type of design is more sensitive, more statistically powerful,
- the information presented was numeric rather than verbal,
- elimination of claim intensity also eliminated masking interaction effects with that factor.

It is not possible at this time to say that any one of these considerations is more important than any other, or if in fact any of them is meaningful at all.

The existence of a source credibility main effect is confirmed by its clear presence in both student and practitioner designs. Also, as Tables 17 and 18 below indicate, this effect carries through to the perceived advocacy scale scores but fails to appear with the vendor evaluation scale scores.

Table 18

Practitioner Sample Perceived Advocacy (ADVSCALE) ANOVA

Effect	SS	d.f.	MS	F	Significance
ID	63.441	1	63.441	1.296	N.S.
S/ID	1957.619	40	48.940		
SC	14.584	1	14.584	3.230	.10*
ID x SC	5.249	1	5.249	1.162	N.S.
SC x S/ID	180.667	40	4.517		
		83			

*Statistically significant at $p \leq .10$

Table 19

Practitioner Sample Vendor Evaluation (VENDSCALE) ANOVA

Effect	SS	d.f.	MS	F	Significance
ID	28.430	1	28.430	1.484	N.S.
S/ID	766.312	40	19.158		
SC	.049	1	.049	.004	N.S.
ID x SC	16.194	1	16.194	1.279	N.S.
SC x S/ID	506.261	40	12.657		
		83			

These results differ from those with the student sample in that the source credibility effect did not carry through to post-discussion vendor evaluation.

As with the student phase data respondents' scores on items comprising the dependent variable scales were summed and a partial correlation analysis performed. To prevent confusion, scale labels used with the practitioners were changed to CONSCALE, ADVSCALE and VENDSCALE for the pre-discussion self-confidence scale, post-discussion perceived advocacy scale and post-discussion vendor evaluation scale respectively. These correspond to Y_{SSCTOT}, Y_{PATOT} and Y_{VETOT} with the student sample and consist of identical items.

Table 20

Practitioner Sample Scale Total Dependent Variable Relationships

Relationship	Correlation Coefficient	N	Significance
CONSCALE-ADVSCALE (zero-order)	.36	82	.001*
ADVSCALE-VENDSCALE (zero-order)	.14	82	.10*
CONSCALE-VENDSCALE (zero-order)	.26	82	.004*
ADVSCALE-VENDSCALE (CONSCALE partialed)	.05	81	.31
CONSCALE-VENDSCALE (ADVSCALE partialed)	.23	81	.02*

*Statistically significant at $p \leq .10$

The data in Table 20 indicate intercorrelation among the dependent variables which seems concentrated in pre-discussion specific self-confidence and post-discussion vendor evaluation. This particular relationship holds up even when common variance with post-discussion perceived advocacy is partialled out. This suggests that mere sharing of information without active advocacy of a particular vendor is sufficient to influence vendor choice when problem specific self-confidence levels are high. If true, this result would be at variance with the postulated model; however, the possibility of such an effect has been raised previously by choice shift researchers.

This type of relationship is meaningful only if it can be demonstrated that the experimental subject's pre-discussion vendor choice was also the group's post-discussion vendor choice. This issue is taken up in the following paragraphs. Note, however, that the postulated relationship between post-discussion perceived advocacy and post-discussion vendor choice does not hold up when common variance due to

self-confidence is eliminated. This does not imply that the relationship does not exist, rather that removal of common variance with self-confidence produces a weaker relationship as evidenced by the difference in zero-order and partial correlation coefficients. This latter result directly confirms the linkage posited in the model.

As with the student data evidence regarding the perceived advocacy-vendor choice relationship is obtained by contingency table analysis. Variables employed and coding procedure are identical to those used to produce Table 14, with one exception, that being the coding of items 41 through 45 in the perceived advocacy scale. The seven-point Likert type items were coded 1 through 4 = Low and 5 through 7 = High.

Table 21

Practitioner Sample Vendor Choice with Perceived Advocacy

Item	χ^2	Significance
41	.012	.91
42	3.003	.08*
43	4.277	.04*
44	8.650	.003*
45	3.027	.08*

*Statistically significant at $p \leq .10$

For Item 42:

		Pre-, Post-discussion Choice		
		Agree	Disagree	
Influential in Determining Group Choice	Low	15	8	23
	High	52	9	61
		67	17	84

Phi = Eta = .222

For Item 43:

Pre-, Post-discussion Choice

Persuasive in Presenting Ideas	Agree	Disagree	
Low	10	7	17
High	57	10	67
	67	17	84

Phi = Eta = .263

For Item 44:

Pre-, Post-discussion Choice

Argued Strongly for One Vendor	Agree	Disagree	
Low	19	12	31
High	48	5	53
	67	17	84

Phi = Eta = .332

for Item 45:

Pre-, Post-discussion Choice

Leader of Group	Agree	Disagree	
Low	29	12	41
High	38	5	43
	67	17	84

Phi = Eta = .219

In all cases, and especially for items 44 and 45, the small frequency in the lower right-hand cell indicates that very seldom did post-discussion group vendor choice disagree with the experimental subject's pre-discussion vendor choice when that subject was highly rated on the perceived advocacy items.

Summarizing the practitioner data:

- Complete validation of the reduced model was obtained,
- Evidence suggestive of new relationships, not postulated and corroborating student sample findings, was found.

Table 22 below summarizes those relationships verified with the practitioner sample.

Table 22

Summary of Practitioner Significant Relationships

Relationship	Statistic	Value	Significance
ID with CONSCALE	F	7.821	.01
SC with CONSCALE	F	4.017	.06
SC with ADVSCALE	F	3.230	.10
CONSCALE with ADVSCALE	r	.36	.001
ADVSCALE with VENDSCALE	r	.14	.10
CONSCALE with VENDSCALE	r	.26	.004
CONSCALE with VENDSCALE (ADVSCALE partialed)	r	.23	.02
ADVSCALE with Pre-, Post-discussion Vendor Choice			
Item 42	χ^2_2	3.003	.08
Item 43	χ^2_2	4.277	.04
Item 44	χ^2_2	8.650	.003
Item 45	χ^2	3.027	.08

Unlike Table 15, omega squared is not calculated as the necessary within-groups mean square does not exist in repeated measures designs.

REFERENCES

1. Items 101 to 105 do not appear directly on the instrument; however, they are computed by averaging the responses of person 1 and person 2 as they evaluate person 3 (the experimental subject) over the characteristics described in items 40 to 44. Where groups are two-person the averaging procedure is not needed and the non-experimental subject's evaluation is used.

2. Journal of Marketing Research, February 1979, pp. 1-102.

3. Nunnally, Jum C. Psychometric Theory, 2nd Edition, New York: McGraw-Hill Book Co. (1978), p. 214.

Chapter IV

CONCLUSIONS AND IMPLICATIONS

At the outset of this investigation it was stated that the research purpose was to explore, and if possible substantiate, relationships among certain vendor influenceable inputs to group choice processes and vendor choice outcomes resulting from these processes. A model postulating the relationships of interest was developed and subsequently experimentally tested on both a student and a practitioner sample.

Examining the results of those tests presented in the previous chapter it would appear that the suggested model is indeed valid and presents a reasonable picture of at least one variety of vendor choice mechanism. The first section of the remainder of this chapter focuses on the theoretical ramifications of these findings, the second on managerial implications, and the last on observations regarding methodological issues relevant to further work in the area.

Theoretical Consequences

The role of advocacy behavior in group choice processes has been established and to some extent specified. Its central place in what I have termed an extended interpersonal model of buyer-seller relationships has also, at least partially, been confirmed. When two or more individuals gather to choose among alternatives it is in fact possible to alter the tone and content of their communications by manipulation of the distribution of information among group members, by attribution of information to a source perceived as being more or less credible, or by varying the strength of claim made by that source. The results of these tests are potentially quite profound, as they suggest that students and

modelers of organizational purchasing processes should consider influence strategies directed at group processes as well as those directed at individual members. In many instances this will involve rethinking the relative importance of attribute as opposed to process variables. On a more micro level the results of this research suggest new avenues of pursuit in organizational buyer behavior. Specifically, the original decision process model, presented in Chapter 3, Figure 6, must now be modified to accommodate alternate linkages. Modified versions, based on both student and practitioner samples are presented in Figures 13 and 14 respectively.

While somewhat different as regards specific linkages, the revised models share certain features. They both indicate that the nature of influence is more complex than originally thought. That is, causal paths emanating from the independent factors do not impact only on pre-discussion specific self-confidence as hypothesized but extend to other of the dependent variables as well. The implication being that alteration of these independent factors may produce enhanced self-confidence or may not; however, even in those cases where self-confidence is not consciously increased the individual may act as if it were.

A most interesting result is that based on the student data which suggests no linkage between specific self-confidence through perceived advocacy to vendor evaluation. Taken at face value this means that inducement of an enhanced state of self-confidence in experimental subjects may be neither a necessary nor sufficient condition for subsequent active vendor adequacy on their part. At the same time, specific self-confidence appears directly related to post-discussion group vendor evaluation. Consideration of these two together might lead one to the inference that the induced self-confidence state may result in subject

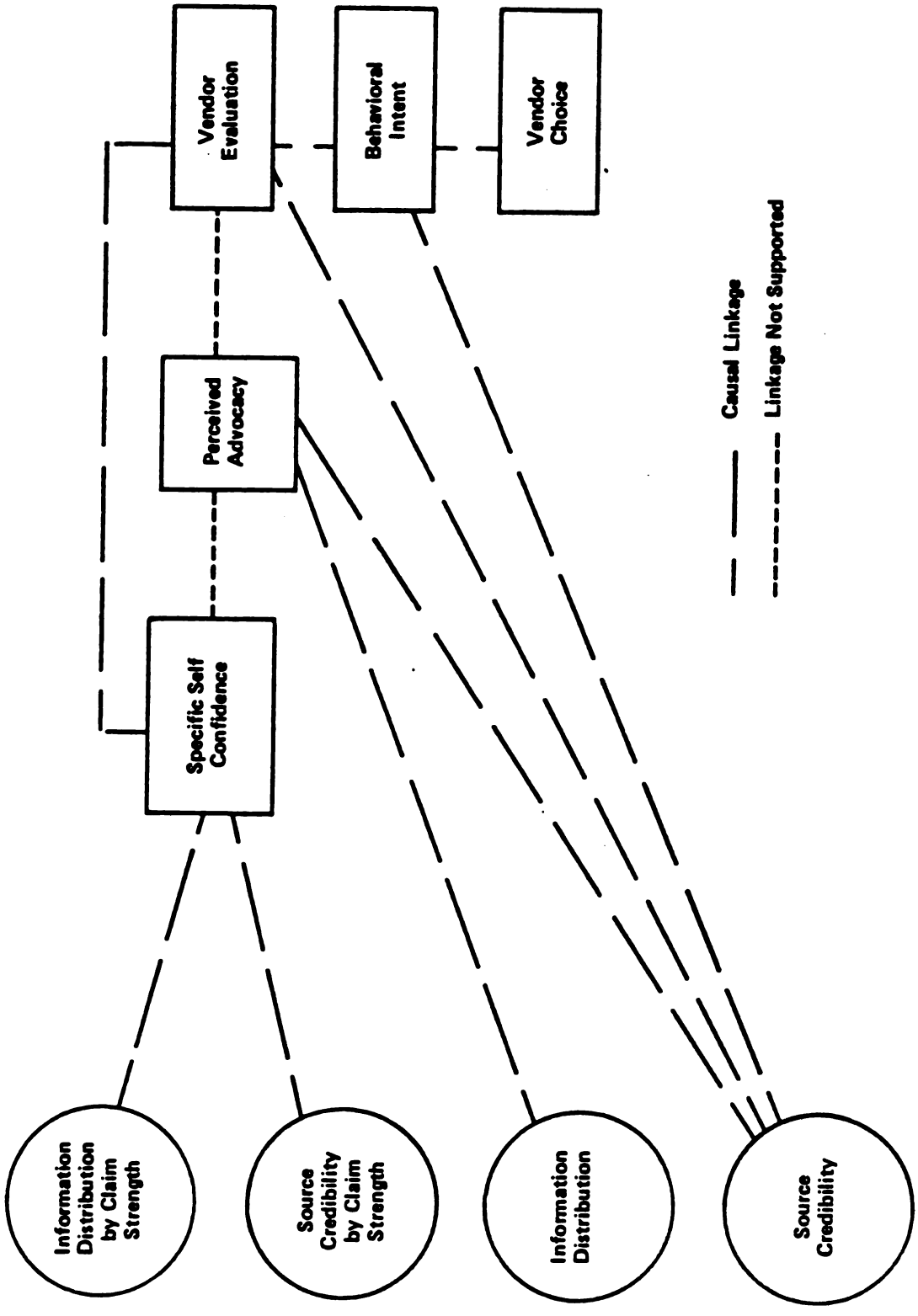


FIGURE 13. CAUSAL MODEL BASED ON STUDENT SAMPLE EXPERIMENT

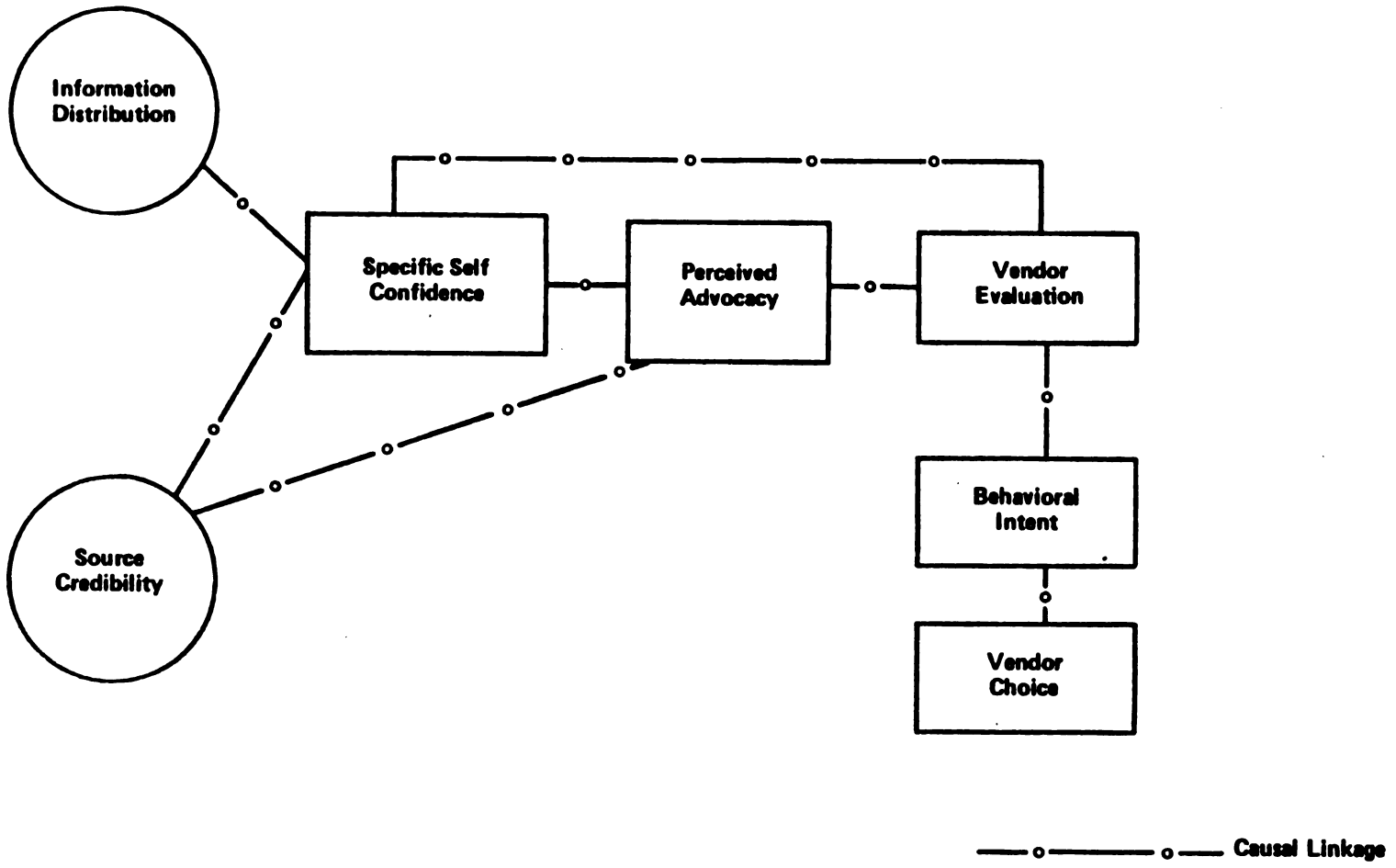


FIGURE 14. CAUSAL MODEL BASED ON PRACTITIONER SAMPLE EXPERIMENT

behaviors influencing vendor choice which are not consciously perceptible by their peers. Research into pre-conscious information processing and non-verbal cue utilization among organizational purchasers remains virtually non-existent. However, it would not be proper to advocate allocation of research resources to this area based on these results alone, as there exists an alternative explanation for them.

Reflecting on administration of the experimental cases to both students and practitioners it seemed that the students were less ego involved in the case itself and its correct solution. Whether it can be said that a condition of lower ego involvement, if such did exist in the first place, is responsible for the differences between student and practitioner results is open to question. Nevertheless, having observed numerous groups of students and practitioners as they worked on and discussed the case my predilection is to place less credence on the student sample findings precisely because of seemingly less ego involvement. The practitioner data indicate that pre-discussion specific self-confidence to perceived advocacy to vendor evaluation linkages do exist.

Another result worthy of note is presence, and absence, of interaction effects. No three-way interaction among information distribution, source credibility and claim strength was found for any of the dependent variables and no two-way interaction for any of the variables other than self-confidence. The lack of a three-way interaction is not surprising as none was predicted by the theories used to develop the model initially. No source credibility by information distribution interaction was evidenced with either population on any of the dependent variables. That these two should not reinforce one another is curious. The interpretation of course being that while either separately may

induce enhanced self-confidence and so on, there is no synergism here; yet, based on considered judgment there should be. One explanation for this may rest in models of cue utilization in human information processing and decision making. Certain of these models, variously labeled as compensatory, additive or expectancy value, treat cues as independent units in essentially linear models. Due to the additive form of the model, the statement that a high evaluation on one cue may balance out a low evaluation on another becomes permissible. This would not be the case were interaction effects present. The lack of demonstrable interaction effects in this research tends to support a compensatory approach. It is true however that both information distribution by claim strength and source credibility by claim strength interactions did appear with the student subjects for specific self-confidence. The source credibility by claim strength interaction could be anticipated on the basis of the McEwen and Greenberg findings cited in Chapter II; however, the other was not.

These effects lead one to represent the mechanism of action as one in which both elements need be present for the indicated result to occur. Alternatively one might interpret their presence by noting that the effect is non-additive, that together it is larger than the sum of both individually. Given either point of view, the presence of interaction prevents one from making unambiguous statements about the influence of the factors singly. Thus one is forced to the conclusion that perhaps both information distribution and source credibility effects on self-confidence are functionally dependent on the level of claim strength when information is presented to subjects verbally rather than numerically. Inasmuch as claim strength did not appear in the practitioner sample experiment, the student population findings suggest a need for further

investigation. On balance, however, both student and practitioner results should be viewed as largely disconfirming the presence of interaction effects.

An issue of substantive concern for virtually all behavioral research is that of threshold effects.[1] That is, relationships between independent factors and dependent variables have been demonstrated on the basis of certain differences between treatment manipulations, e.g., high vs. low source credibility. Yet if the differences were smaller, would the effect remain? Because a fixed rather than random experimental design was chosen interpretations regarding the effects due to independent factors are constrained to only those levels of the factors actually present in the design. Regarding information distribution this means that at present conclusions may only be drawn concerning differences of the same magnitude employed here, i.e., 9 vs. 15 and 8 vs. 12 cues. Similar restrictions apply to source credibility and claim strength and are especially relevant to claim strength. This is due to the fact that no pre-tests of manipulations of claim strength or intensity were conducted and so the relationship between treatment levels is purely ordinal. Such is not the case with source credibility in which treatment level differences were pre-tested and are known metrically.

The fact remains however that the effects of other levels of treatments remains wholly unknown. This suggests a series of single factor, multiple level experiments in which treatment levels are first ordered metrically and equal interval differences selected for inclusion in a three or higher level design. It is only in this way that unambiguous statements about the effects of the factors over a range of treatment differences can be made, and threshold effects, if present, uncovered.

The problem associated with lack of knowledge regarding threshold effects is but one of many impacting on the pragmatic managerial value of this research, a subject taken up in succeeding paragraphs.

Managerial Implications

The value to practicing industrial marketing managers of what has been accomplished here is perhaps less substantial than to academic students of organizational buying processes and procedures. The reason for this lies quite simply in a trade-off common to virtually all experimental research, i.e., a lack of external validity. In an experiment the researcher controls for or eliminates as best as possible influences from sources other than the variables under study. Yet it is precisely the richness of interaction amongst all of these variables, many of them largely situational, that accounts for variance associated with naturalistic behavior. Thus this research has purposefully excluded factors such as hierarchical position or status, personality, decision importance and tenure in present position even though each might reasonably be assumed to have rather substantial influence on a person's willingness to assume the advocate's role in discussion. To include them would be to multiply the number of cells in the design, and hence requirements for subjects, to the point where the research becomes nearly impossible to carry out. The problem is exacerbated by the fact that groups rather than individuals are the unit of analysis.

These shortcomings aside, certain of the findings do have implications for management. First it has been shown that it is possible for a group member to be stimulated to take on an advocacy role by providing him with task relevant information not made available to others. The value of this approach however varies with the circumstances surrounding

its application. Chief among these circumstances is the ability of the vendor representative to become a trusted source of information. That source credibility positively influences a person's willingness to assimilate and act on information from that source is certainly not a new finding. However, interviews with buyers and sellers alike revealed that bond paper copier manufacturers frequently rotate representatives into and out of territories with the effect that seldom are they able to establish the kind of rapport implied by the source credibility effect. For this reason, distributors and territory sales managers often assume the role of trusted source since they tend to be more permanent. The implications of this finding for personnel policies in sales management cannot be over-emphasized. Rotation of sales representatives is common practice. The varied experience base provided by rotation is generally agreed to be beneficial in developing an individual's skill in coping with unanticipated events. Nonetheless a price is paid. The buyer-seller interpersonal bond can be a powerful factor in vendor selection when properly cultivated. Interterritorial rotation is inimical to that bond.

Another of the circumstances directly impinging on the utility of the approach is that of selection of the potential advocate. Although not explicitly tested here, observation of the groups revealed that providing additional information to persons incapable or unwilling to utilize it produced no result. It is an "old saw" among sales representatives that one must try to reach the important or powerful person(s) for a given decision. What has been learned here in no way changes the truth of this maxim. In selecting an individual as a potential advocate the sales representative must choose wisely. The person selected must be someone who is capable of playing the role effectively. That is not

to say always the boss, but at the very least someone who is a member of the buying center and whose opinions will be given consideration by the others. This is the question most frequently raised by sales representatives I have spoken with in connection with this research. That is, "How do you go about finding out who these potential advocates might be?" Suffice it to say that no formula approach arising from a single piece of research will yield a satisfactory answer. What does clearly emerge though are a set of boundary conditions. The potential advocate is one who is technically knowledgeable to begin with and is respected, and probably liked, by the hierarchical leader. In this particular research observation of the natural practitioner groups suggests that junior engineering or supervisory personnel ambitious to demonstrate proficiency are likely candidates.

As mentioned in the first chapter, the sales representative often may have few degrees of freedom in this choice, in which case additional information regarding approaches to the potential advocate will be of great value. Since many of the factors that will determine an individual's ability and willingness to become an advocate in a given situation are outside of the vendor representative's control, it is imperative that he know as much as possible about those factors that are within his range of influence.

To reiterate an earlier point, perhaps the greatest contribution of this work to industrial marketing practice lies in the realization, not empirically substantiated prior to this time, that it is possible to stimulate an individual to assume the advocate role. Moreover, once having done so it is likely that the course of action or choice they are advocating will in fact be the one the group finally selects. This will be especially true when other members of the group are being exposed

to those arguments and information for the first time in the course of discussion. Thus it appears that following the course of attempting to expose all of the members of the decision group to the arguments favoring choice of your offering may, in some instances, not be the most advisable course at all.

Returning to the generic form of the decision process model it becomes apparent that the success of this extended interpersonal approach rests on the advocate receiving positive reinforcement, on a personal level, as one of the post-decision outcomes. Typically this is not something the vendor representative is in a position to provide directly; however, by remaining aware of and interested in maintenance and other post-sale customer services he may facilitate the process. The advocate has been asked to risk personal status in order to go to bat for the vendor. If that vendor fails to produce according to expectations, further influence attempts are likely to fall on deaf ears. Thus vendors considering adoption of such an approach must weigh their ability to deliver on promises made.

From the foregoing discussion it is clear that more detailed work, and perhaps of a different nature as well, would be desirable before industrial marketing managers implement procedures based on these findings. Certain of the methodological issues relevant to that further work are presented in the concluding portion of the chapter.

Issues in Future Research

The first point to be made in this regard is that the group must remain the level of analysis. This requirement is inescapable. Moreover if external validity is to be improved a far greater proportion of organizational buyer behavior research must be conducted with natural

groups. This statement is not made naively. Locating and securing the cooperation of natural group members seems at first next to impossible. However, if one is willing to conduct research a step at a time and in a way that small sample sizes may be accommodated then the problems are not insurmountable.

For all practical purposes, adoption of this approach rules out multivariate statistical analysis, e.g., multiple regression and the typical large data base it requires. This is not to say that survey research can be of no further value. Quite the contrary it is absolutely necessary to identify the factors that later take on pivotal importance in causal research.

Nevertheless it would seem unwise to attempt to discover decision process mechanisms themselves through mail surveys. At present only two approaches lend themselves to this type of endeavor. The first is a sociological technique termed ethnography and is based on participant observation as a data gathering technique. The research of Margaret Mead with primitive cultures was largely ethnographic. The type of data collected is virtually all qualitative and interpretation rests entirely with the participant observer who must be highly trained, especially in perceiving non-verbal communication.

The principal advantage of ethnographic research is that it is virtually the only approach which permits simultaneous monitoring of several variables <u>in their natural setting</u>. It is truly <u>in vivo</u> research. In this way the artificiality associated with experimental research is substantially reduced. Ethnography is currently finding application in many areas, for example, in education where the researcher, perhaps posing as a teacher's aid, monitors classroom behaviors for an entire term, or academic year. The chief problem with

ethnography is a complete lack of predictive validity, in fact of any scientific objectivity at all. Insofar as publication in current marketing journals goes, this would appear to be a crippling liability. However, if presented as an extension of the traditional case method, it presents a substantial opportunity for researchers to achieve a much fuller understanding of processes.

The second approach is small sample causal research. Experimentation is of course suitable and the reasons for its choice in this research were presented in some detail earlier. The success or failure of experimental research rests fundamentally on three factors,

1. the salience of the variables included in the design,
2. the quality of the operationalization of the design, and,
3. the accuracy and precision of dependent variable measurement.

Criticism of the current investigation over these three criteria is utilized to provide guidelines for future improvement.

From a conceptual perspective the deductive approach used to develop the decision process model has significant advantages, the principal one of course being a safeguard against performing theoretically irrelevant research. However it is certainly no guarantee that the work will be of any value to practitioners. The influence of the independent factors included in this study was demonstrated, in several instances, to be statistically significant; however, in no case did any account for more than 10 percent of the total variance in a dependent variable. It is doubtful that the remaining 90 percent of the variance is due solely to true individual differences and measurement error. Other causal factors quite likely exist and need to be identified.

Regarding the quality of design operationalization the chief shortcoming of this research was an inability to isolate the subject groups

in such a way as to absolutely guarantee observational independence. It was relatively easy to prevent outright inter-group collaboration; however, the groups did have to share a large room at the time of case administration and there was no way to prevent one group from overhearing the deliberations of ones adjacent to it. Not knowing how great an effect this may have had on the outcome it is impossible to state that isolation of the groups is a categorical necessity; however, it is at the very least highly desirable.

Quality of operationalization may be measured by means of a power calculation. Appendix 8 presents an example power determination based on this research.

The third criterion indicated as influencing experimental research usefulness was the quality of dependent variable measurement. The present study has achieved some measure of success in this regard as the reported Cronbach Alpha coefficients are well within the range deemed acceptable for basic research.[2] This was to be expected as the items in the scales had been factor analyzed on pre-test student data. The factor analysis revealed that the items did in fact measure the same content domain. Even when the item writer is very familiar with a content area, factorization of pre-test data is strongly recommended unless a large number, i.e., more than 10, items are planned for each construct measured.

As regards causal research, an alternative to classical experimentation is path or structural equations analysis. Several of the characteristics of a structural equation approach as opposed to classical experimentation have been presented by Bagozzi[3] and are summarized briefly here. Perhaps the primary benefit to be gained from structural equation modeling is a recognition on the researcher's part that

observable variables are not always one and the same with the constructs they represent. In the idiom of psychometric theory one would say that observable variables are fallible measures of true or latent traits. This recognition leads the researcher to, first, develop measurement devices with multiple indicia permitting assessment of measurement error and, second, consciously consider alternative or rival hypotheses at the time of initial experimental design. A third benefit derives from the focus on item or question reliability, namely, researchers devote greater attention to item writing and scale construction with a resulting improvement in content validity.

The basic approach in structural equations modeling is to employ multiple item measures for both independent and dependent variables. The independent variable indicia are manipulation checks while the dependent variable items measure the extent of treatment influence.

Figure 15 presents a structural equation representation of one portion of the causal model. In this model χ is the independent factor source credibility, manipulated by means of high vs. low treatment levels, η_1 is the latent trait perceived source credibility which is measured by four manipulation checks, which in the case of the student instrument are items 15-18. The manipulation checks are subject to error represented by ε_1 to ε_4 which constricts the relationship, λ_1 to λ_4, between manipulated independent variable and latent independent construct and the equation error of estimation for that construct.

Moving now to the dependent variable, β is the strength of relationship among the two latent constructs perceived source credibility and specific self-confidence. Self-confidence is measured by items 23, 24 and 25 each having a relationship, λ_5 through λ_6 with the latent construct attenuated by the errors ε_5 to ε_6. And finally, the equation

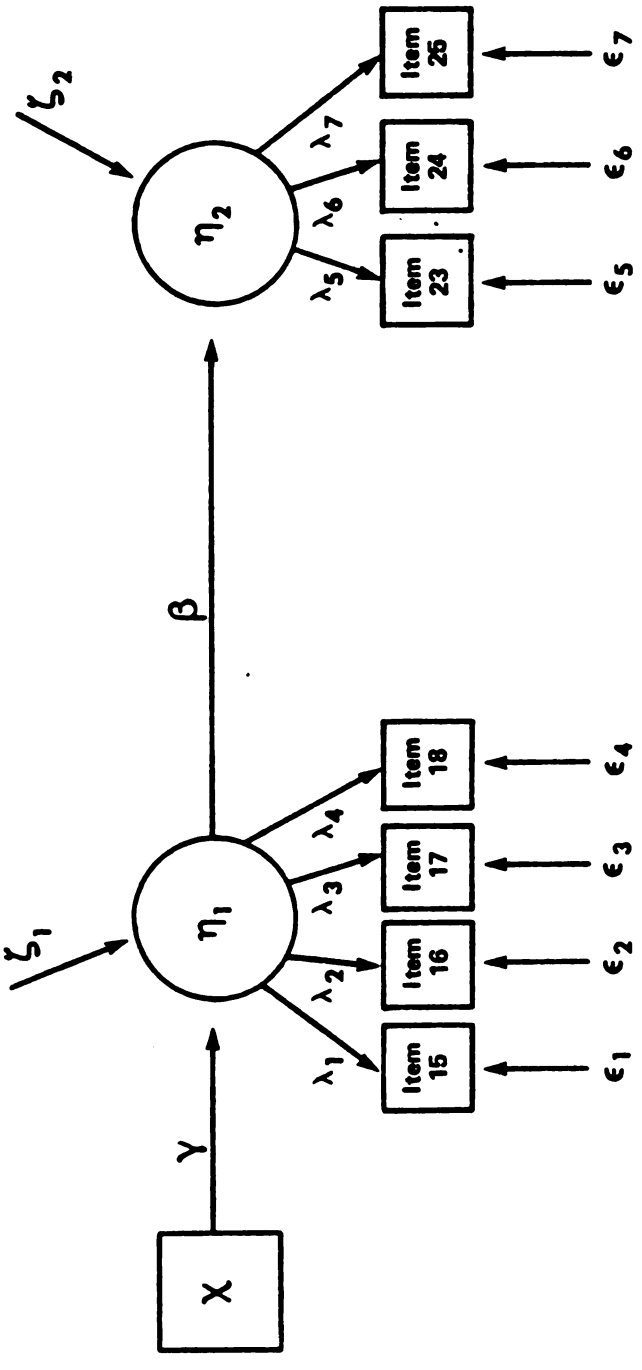


FIGURE 15. A STRUCTURAL EQUATION MODEL OF THE SOURCE CREDIBILITY-SELF-CONFIDENCE LINKAGE

error of estimation of latent specific self-confidence, η_2, is given by ζ_2. The parameters of the model are estimated by maximum likelihood algorithms and the overall fit of the model is tested by means of a Chi-square statistic.

The appeal of the structural equations approach lies in the fact that a statistically significant β is strong indication of actual relationship no longer subject to artifactual challenge. Also, in the event that β is not significant the researcher has the capability to perform diagnostic operations. That is, faulty operationalization in treatment manipulation is indicated in numerically low values for λ_1 through λ_4, whereas excessive measurement error on the dependent variable side would be evidenced by low values for λ_5 through λ_7.

Also in models employing more than two latent constructs, alternative causal paths may be tested as rival hypotheses. That is, a postulated serial linkage  may be tested against a coincident causal model of the form  . In general, structural equations analysis may represent a true methodological advancement. However, one strong caveat remains, namely, the existence or non-existence of causal relationships fundamentally derives from the correctness and logic of the theoretical model not on the characteristics of the technique employed to test that model.

Summary

The research described in this and preceding chapters has accomplished the three objectives originally established. That is, a new causal model of a vendor influenceable group choice process has been deductively generated. This model provides insight into mechanisms of group interaction and suggests sales strategies adoptable by organizational

marketers. It is characterized by the role of advocate on the part of a member of the buying center and may be viewed as an extended interpersonal influence model.

The empirical portion of the research has demonstrated that advocacy behavior, perceptible to peers in a decision making group, can be stimulated and facilitated by vendor influenceable variables. Each of the three factors selected to operationalize the model have been shown, either singly or in combination, on both student and management populations, to be capable of producing perceptible advocacy behavior. Furthermore it has been shown that behaviors on the part of individuals assuming the advocate role do influence vendor choice.

Finally the research method employed has been shown to be a suitable approach to group focused causal research into organizational purchasing mechanisms. The relative merits of small sample experimental and non-experimental procedures make them eminently appropriate for continued research in the field of organizational buyer behavior.

REFERENCES

1. Credit must be given to Dr. George Waggenheim of the Michigan State University Marketing faculty for initially raising this question during conversations at the time of the initial conceptualization of the research.

2. Keppel, G. Design and Analysis: A Researchers Handbook, Englewood Cliffs, N.J.: Prentice Hall Inc. (1973), 525-540.

3. Bagozzi, R. P., "Structural Equation Models in Experimental Research, Journal of Marketing Research, 14, (May 1977), 209-226.

APPENDIX 1

APPENDIX 1

MICHIGAN STATE UNIVERSITY

OFFICE FOR RESEARCH DEVELOPMENT
238 ADMINISTRATION BUILDING

EAST LANSING · MICHIGAN · 48824

September 13, 1977

Mr. Robert E. Krapfel
Graduate School of Business Administration
Department of Marketing and
Transportation Administration
Campus

Dear Mr. Krapfel:

Subject: Proposal Entitled "Information Distribution, Source Credibility and Evidence Weight as Determinants of Organizational Purchase Outcomes: An Experimental Approach"

The above referenced project was recently submitted for review to the University Committee on Research Involving Human Subjects (UCRIHS).

We are pleased to advise that this review indicated that the rights and welfare of the human subjects appear to be adequately protected and the Committee, therefore, approved this project at its meeting on September 12, 1977.

Thank you for bringing this project to our attention. If we can be of any future help, please do not hesitate to let us know.

Sincerely,

Henry E. Bredeck
Chairman, UCRIHS

jms

cc: Dr. Leo G. Erickson

APPENDIX 2

APPENDIX 2

Plasti-Part Inc.

Plasti-Part is a medium sized manufacturing firm located in a large Mid-western city. They produce a line of injection molded plastic gears used in light machinery, office equipment, toys, etc. The firm has had an upsurge in business over the last three years and this has greatly increased the amount of paperwork and record-keeping the office staff must cope with. Several of the secretaries have complained of being overworked and office efficiency has declined noticeably.

Mr. Ronald Brock, the general manager, has asked the office manager, personnel manager and head of the accounting department to look into the problem and make recommendations. That was four weeks ago.

The evaluation team uncovered several minor problems and one major bottleneck, the fact that all photocopying, regardless of department, is routed to a centralized office. The decision to use a centralized reproduction office was made several years ago in the interest of cost savings and efficiency. Now, however, the volume of photocopying is so large that people often have to wait 2-4 days to get their copies back. When copies are needed in a hurry secretaries often go to an outside copying service, but this has resulted in a high cost per copy and is a very inefficient use of secretaries' time. In addition, the 2-4 day wait on regular jobs results in costly delays in order processing, production schedule review, etc.

The team decided that the firm should purchase additional copiers to be placed in each of the three departments producing the most paperwork. In order to get a quantity discount, the three units would all be purchased from the same vendor and would be the same model. The team also isolated the following factors as being important in evaluating competing brands.

1. Product features, e.g., copying speed, ease of use, copy quality, simple construction to prevent paper jamming, etc.

2. Ability of the vendor firm to provide dependable maintenance service.

3. Ability of the vendor firm to deliver the units on time and get them operational quickly.

4. Cost, includes initial purchase price, plus per copy user charges and maintenance fees.

5. Overall reputation of the vendor.

Based on preliminary evaluations, two brands are now being considered as alternatives. These are Brand A and Brand B. (Actual names are not used to prevent bias based on personal experience you may have had with different brands of photocopiers.)

Attachment I contains the information that has been made available to you up until this time. In four days the team must recommend one of the two brands to Mr. Brock; therefore, you must choose one system based on currently available information.

Attachment 1

The information below was supplied by Bill Williams. Bill is the sales representative for vendor A (Brand A), which is a small firm whose name you are not very familiar with. Bill has only talked to you once before.

"I think our machine is comparable to any other machine in its price class. We have tested them against both Brand B and other manufacturers' machines.

"Our copy quality is good, in fact, in blind tests some people have been unable to distinguish between our copies and the originals they were made from. The machine is well-built and easy to operate.

We have a contract with a maintenance company in this area, so a service representative is always close at hand. We deliver within 5 working days after your order is placed.

"You certainly can't say our purchase price isn't right since it's $800 less than Brand B's. Now you may be thinking that since Brand B is an older, more established firm that builds solid machines, that they would be a better choice, but I think when you compare the two machines across the board you'll come to the conclusion that you will be better off with ours."

Attachment 1

The following information was supplied by Jim Fisher. Jim is the sales representative for vendor A (Brand A), a firm that you have purchased other office equipment from before. Over the years you have been very satisfied with Jim and the company's performance.

"I think our machine is comparable to any other machine in its price class. We have tested them against both Brand B and other manufacturers' machines.

"Our copy quality is good, in fact, in blind tests some people have been unable to distinguish between our copies and the originals they were made from. The machine is well-built and easy to operate.

"We have a contract with a maintenance company in this area, so a service representative is always close at hand. We deliver with 5 working days after your order is placed.

You certainly can't say our purchase price isn't right since it's $800 less than Brand B's. Now you may be thinking that since Brand B is an older, more established firm that builds solid machines, that they would be a better choice, but I think when you compare the two machines across the board you'll come to the conclusion that you will be better off with ours."

Attachment 1

The information below was supplied by Bill Williams. Bill is the sales representative for vendor A (Brand A), which is a small firm whose name you are not familiar with. Bill has only talked to you once before.

"I think our machine is comparable to any other machine in its price class. We have tested them against both Brand B and other manufacturers' machines.

"Our copy quality is good, in fact, in blind tests some people have been unable to distinguish between our copies and the originals they were made from. This is due to a newly patented process that uses a photo-cell just like in expensive cameras to precisely meter the exposture time. The machine is well-built and subjected to exhaustive quality control checks before you get it. We have engineered it specially to make it easy to operate and refill with paper.

"A local maintenance company services all of our machines so a service representative is always close at hand. We promise to deliver your machines within 5 working days after your order is received; in the past we have actually shipped copiers by air freight to live up to this promise.

"Of course the price is right too. Our machine is $800 less than Brand B's and maintenance costs are fixed when you select the annual service contract option. In fact, for our customers with monthly copying volume over 8,000 copies our total monthly costs work out to $4.8¢ per copy. This compares favorably with our estimate of 5.1¢ per copy for the comparable Brand B machine.

"It's true that Brand B is an older more established firm, but I think when you compare the two machines across the board you'll come to the conclusion that you'll be better off with ours."

Attachment 1

The following information was supplied by Jim Fisher. Jim is the sales representative for vendor A (Brand A), a firm that you have purchased other office equipment from before. Over the years you have been very satisfied with Jim and the company's performance.

"I think our machine is comparable to any other machine in its price class. We have tested them against both Brand B and other manufacturers' machines.

"Our copy quality is good, in fact, in blind tests some people have been unable to distinguish between our copies and the originals they were made from. This is due to a newly patented process that uses a photocell just like in expensive cameras to precisely meter the exposure time. The machine is well-built and subjected to exhaustive quality control checks before you get it. We have engineered it specially to make it easy to operate and refill with paper.

"A local maintenance company services all of our machines so a service representative is always close at hand. We promise to deliver your machines within 5 working days after your order is received; in the past we have actually shipped copiers by air freight to live up to this promise.

"Of course the price is right too. Our machine is $800 less than Brand B's and maintenance costs are fixed when you select the annual service contract option. In fact, for our customers with monthly copying volume over 8,000 copies our total monthly costs work out to 4.8¢ per copy. This compares favorably with our estimate of 5.1¢ per copy for the comparable Brand B machine.

"It's true that Brand B is an older more established firm, but I think when you compare the two machines across the board you'll come to the conclusion that you'll be better off with ours."

Attachment 1

The information below was supplied by Bill Williams. Bill is the sales representative for vendor A (Brand A), which is a small firm whose name you are not familiar with. Bill has only talked to you once before.

"I think our machine is superior to any other machine in its price class. We have tested them against both Brand B and other manufacturers' machines.

"Our copy quality is excellent, in fact, in blind tests most people have been unable to distinguish between our copies and the originals they were made from. The machine is exceptionally well-built and we have taken particular care to make the machine easy to operate.

"We have a contract with a maintenance company in this area, so you never have to worry about breakdowns, since a service representative is always close at hand. We guarantee delivery within 5 working days after your order is placed.

"You must admit that the price is right since it is $800 less than Brand B's. While it is true that Brand B is an older, more established firm, we are gaining an excellent reputation very fast, and when you compare Brand A with Brand B across the board you'll surely conclude that you will be much better off with Brand A."

Attachment 1

The following information was supplied by Jim Fisher. Jim is the sales representative for vendor A (Brand A), a firm that you have purchased other office equipment from before. Over the years you have been very satisfied with Jim and the company's performance.

"I think our machine is superior to any other machine in its price class. We have tested them against both Brand B and other manufacturers' machines.

"Our copy quality is excellent, in fact, in blind tests most people have been unable to distinguish between our copies and the originals they were made from. The machine is exceptionally well-built and we have taken particular care to make the machine easy to operate.

"We have a contract with a maintenance company in this area, so you never have to worry about breakdowns since a service representative is always close at hand. We guarantee delivery within 5 working days after your order is placed.

"You must admit that the price is right since it is $800 less than Brand B's. While it is true that Brand B is an older, more established firm, we are gaining an excellent reputation very fast, and when you compare Brand A with Brand B across the board you'll surely conclude that you will be much better off with Brand A."

Attachment 1

The information below was supplied by Bill Williams. Bill is the sales representative for vendor A (Brand A), which is a small firm whose name you are not very familiar with. Bill has only talked to you once before.

"I think our machine is superior to any other machine in its price class. We have tested them against both Brand B and other manufacturers' machines.

"Our copy quality is excellent, in fact, in blind tests most people have been unable to distinguish between our copies and the originals they were made from. This is due to a newly patented process that uses a photocell just like in espensive cameras to precisely meter the exposure time. The machine is exceptionally well-built and subjected to exhaustive quality control checks before you get it. We have engineered it specially to make it easy to operate and refill with paper.

"We have a contract with a maintenance company in the area, so you never have to worry about breakdowns, since a service representative is always close at hand. We guarantee delivery within 5 working days after your order is placed; in the past we have actually shipped copiers by air freight to live up to this guarantee.

"You must admit that the price is right since it is $800 less than Brand B's and maintenance costs are fixed when you select the annual service contract option. In fact, for our customers with monthly copying volume over 8,000 copies our total monthly costs work out to 4.8¢ per copy. This compares quite favorably with our estimate of 5.3¢ per copy for the comparable Brand B machine.

"While it is true that Brand B is an older, more established firm, we are gaining an excellent reputation in this area very fast, and when you compare Brand A with Brand B across the board you'll surely conclude that you will be much better off with Brand A."

Attachment 1

The following information was supplied by Jim Fisher. Jim is the sales representative for vendor A (Brand A), a firm that you have purchased other office equipment from before. Over the years you have been very satisfied with Jim and the company's performance.

"I think our machine is superior to any other machine in its price class. We have tested them against both Brand B and other manufacturers' machines.

"Our copy quality is excellent, in fact, in blind tests most people have been unable to distinguish between our copies and the originals they were made from. This is due to a newly patented process that uses a photocell just like in expensive cameras to precisely meter the exposure time. The machine is exceptionally well-built and subjected to exhaustive quality control checks before you get it. We have engineered it specially to make it easy to operate and refill with paper.

"We have a contract with a maintenance company in the area, so you never have to worry about breakdowns, since a service representative is always close at hand. We guarantee delivery within 5 working days after your order is placed; in the past we have actually shipped copiers by air freight to live up to this guarantee.

"You must admit that the price is right since it is $800 less than Brand B's and maintenance costs are fixed when you select the annual service contract option. In fact, for our customers with monthly copying volume over 8,000 copies our total monthly costs work out to 4.8¢ per copy. This compares quite favorably with our estimate of 5.3¢ per copy for the comparable Brand B machine.

"While it is true that Brand B is an older, more established firm, we are gaining an excellent reputation in this area very fast, and when you compare Brand A with Brand B across the board you'll surely conclude that you will be much better off with Brand A."

Attachment 1

The information below was supplied by Andy Day. Andy is a good friend of yours and head of the production department at Plasti-Part.

"I've read the literature put out by the two different vendors and it seems that Brand A and Brand B are rather similar. It's true that the Brand A machine copies faster and seems easier to operate, but the Brand B machine looks like it will have lower operating and maintenance costs.

"Brand B is a larger firm with a well-known name and that is probably at least partially due to their rugged construction. They claim the machines only have to be serviced once a month and if that is true it's pretty impressive.

"On the other hand, from what I've heard, if you want to be able to take delivery on short notice Brand A gives much better service."

Attachment 1

The information below was supplied by Ray Frankel. Ray is the purchasing agent for HRM Inc., a manufacturer across town, who you learned has purchased two copiers in the past year.

"Brand A is a pretty good machine. It is reasonably reliable and copy quality is O.K. We haven't had any real serious maintenance problems, although one of their machines did break down 2 months ago and it took them a week and a half to come up with the right replacement part.

"As I recall we did get delivery when we were supposed to but the total monthly costs were a surprise. The purchase price of $4,500 was reasonable but their machines need special paper which costs more.

"Of course, I've heard Brand B's machines are good too. They have a real fine maintenance record and their costs are low considering the fact that it's a big name outfit. They have had problems with copy quality though and you don't always get the machines when you want them.

"I really don't have strong feelings for or against either one--it's just a matter of which considerations are more important to you."

APPENDIX 3

APPENDIX 3

Information Source	Evaluation
1. Independent, prestigious consulting firm.	Trustworthiness: VH_:_:_:_:_:_VL Competence : VH_:_:_:_:_:_:_VL
2. Purchasing agent in competing firm that bought one three months ago.	Trustworthiness: VH_:_:_:_:_:_:_VL Competence : VH_:_:_:_:_:_:_VL
3. Purchasing agent in another industry who bought one three months ago.	Trustworthiness: VH_:_:_:_:_:_:_VL Competence : VH_:_:_:_:_:_:_VL
4. A friend of yours in a firm which bought one three months ago.	Trustworthiness: VH_:_:_:_:_:_:_VL Competence : VH_:_:_:_:_:_:_VL
5. A friend inside your own company in the accounting department.	Trustworthiness: VH_:_:_:_:_:_:_VL Competence : VH_:_:_:_:_:_:_VL
6. Sales representative of one of the competing firms. Your firm has done business with them for many years - well satisfied.	Trustworthiness: VH_:_:_:_:_:_:_VL Competence : VH_:_:_:_:_:_:_VL
7. Same as six above only the company has only a so-so performance record.	Trustworthiness: VH_:_:_:_:_:_:_VL Competence : VH_:_:_:_:_:_:_VL
8. Sales representative of one of the competing firms. You have no prior experience with this firm - they are large with easily recognizable name.	Trustworthiness: VH_:_:_:_:_:_:_VL Competence : VH_:_:_:_:_:_:_VL
9. Same as eight above only the sales rep is from a small firm whose name you are not familiar with.	Trustworthiness: VH_:_:_:_:_:_:_VL Competence : VH_:_:_:_:_:_:_VL
10. _____ _____ _____	Trustworthiness: VH_:_:_:_:_:_:_VL Competence : VH_:_:_:_:_:_:_VL
11. _____ _____ _____	Trustworthiness: VH_:_:_:_:_:_:_VL Competence : VH_:_:_:_:_:_:_VL

APPENDIX 4

APPENDIX 4

Directions

Please follow these instructions carefully. Answer all questions as objectively and honestly as you can. Your response will be kept absolutely confidential.

There are two types of questions you are asked to answer:

A. The first requires you to divide ten (10) points between two or three objects or persons. An example of this type is:

	Smith	Jones	West
1. Speaking ability	6	3	1

Here you are indicating that Smith is twice as good a speaker as Jones and Jones is three times better than West. You may divide the ten points anyway you choose but make sure that one (1) point is given to each person or thing evaluated. DO NOT GIVE FRACTIONAL POINTS, E.G., 3.5.

B. The second type of question requires you to indicate, by circling a number, the one location on a seven-point scale that best expressed your opinion or judgment. For example:

	Completely True						Completely False
1. All computers do essentially the same thing.	7	(6)	5	4	3	2	1

Do not leave out any of the questions. Even if you are not completely sure of an answer, give the answer that is your best guess.

Part I

All questions in this section refer to the case itself and the information contained in it. In making your evaluations consider only information presented in the case, that is, as best you can, disregard any knowledge of the subject you may have gotten from other sources. (Divide 10 points between the two systems for each item.)

	Brand A	Brand B
1. Product Features	_____	_____
2. Maintenance Services	_____	_____
3. Reliable Delivery	_____	_____
4. Cost	_____	_____
5. Vendor Reputation	_____	_____
6. Overall Acceptability	_____	_____
7. Overall Desirability	_____	_____
8. Likelihood that you would buy	_____	_____

9. Which system is your choice as the one Plasti-Part should buy? (Circle one)

    1. Brand A
    2. Brand B

How important was each of the following factors to you in making your decision? (Please circle one number for each factor.)

	Very High Importance						Very Low Importance
10. Product Features	7	6	5	4	3	2	1
11. Maintenance Services	7	6	5	4	3	2	1
12. Reliable Delivery	7	6	5	4	3	2	1
13. Cost	7	6	5	4	3	2	1
14. Vendor Reputation	7	6	5	4	3	2	1

Part II

The following questions concern your personal judgment and feelings about the decision you have just made. Please answer all questions by circling one number only.

15. How trustworthy do you think the source of your information is?

Very Trustworthy	7	6	5	4	3	2	1	Not Trustworthy At All

16. How reliable do you think the source of your information is?

Very Reliable	7	6	5	4	3	2	1	Not Reliable At All

17. How knowledgeable do you think the source of your information is?

Very Knowledgeable	7	6	5	4	3	2	1	Not Knowledgeable At All

18. How competent do you think the source of your information is?

Very Competent	7	6	5	4	3	2	1	Not Competent At All

19. The information in the attachment indicates that Brand A is a better quality product.

Agree Completely	7	6	5	4	3	2	1	Disagree Completely

20. The information in the attachment indicates that Brand A is a better value for the money.

Agree Completely	7	6	5	4	3	2	1	Disagree Completely

21. The information in the attachment indicates that Brand A is a more dependable product.

Agree Completely	7	6	5	4	3	2	1	Disagree Completely

22. The information in the attachment indicates that with Brand A comes better service.

Agree Completely	7	6	5	4	3	2	1	Disagree Completely

23. How confident are you that you have made the best choice?

Very Confident	7	6	5	4	3	2	1	Not Confident At All

24. How sure are you that you have analyzed the case correctly?

Very Sure	7	6	5	4	3	2	1	Not Sure At All

25. How strongly do you feel you have made a correct decision?

Very Strongly	7	6	5	4	3	2	1	Not Strongly At All

* *

DO NOT GO ON TO PART III UNTIL AFTER YOU HAVE DISCUSSED THE CASE AS A GROUP!!!!

Part III

Based on the discussion your group has just had, please evaluate the two brands again.

		Brand A	Brand B
26.	Product Features	_____	_____
27.	Maintenance Services	_____	_____
28.	Reliable Delivery	_____	_____
29.	Cost	_____	_____
30.	Vendor Reputation	_____	_____
31.	Overall Acceptability	_____	_____
32.	Overall Desirability	_____	_____
33.	Likelihood that you would buy	_____	_____

34. Which system is your choice as the one Plasti-Part should buy? (Circle one)

    1. Brand A
    2. Brand B

How important was each of the following factors to you in making your decision? (Please circle one number for each factor.)

		Very High Importance						Very Low Importance
35.	Product Features	7	6	5	4	3	2	1
36.	Maintenance Services	7	6	5	4	3	2	1
37.	Reliable Delivery	7	6	5	4	3	2	1
38.	Cost	7	6	5	4	3	2	1
39.	Vendor Reputation	7	6	5	4	3	2	1

Part IV

In this section you are to evaluate yourself and the other members of your group. Remember, you must give each person at least one (1) point, the points must add to ten on each line, and a higher number of points means a higher rating on that characteristic.

		Person 1 Name	Person 2 Name	Person 3 Name
40.	Participation in discussion	_____	_____	_____
41.	Amount of influence in determining group choice	_____	_____	_____
42.	Talkativeness in discussion	_____	_____	_____
43.	Persuasiveness in getting group to go along with his/her ideas	_____	_____	_____
44.	Strength of argument to get group to choose one system over another	_____	_____	_____
45.	Leader of the group	_____	_____	_____
46.	Seemed confident that his/her choice was best	_____	_____	_____
47.	Competence, that is, analyzed the case correctly	_____	_____	_____
48.	Overall asset in helping group make best choice	_____	_____	_____
49.	Likeable and easy to work with	_____	_____	_____
50.	Would like to work with again	_____	_____	_____

APPENDIX 5

APPENDIX 5

General Products Inc.

The purchasing agent in a fabrication plant has requested your recommendation of a walk-up free access bond paper copier to be used by their office staff. He has also supplied the following information:

A monthly volume of 10-12,000 copies is expected, most of which will be 1-3 copies/original. Roughly 75% of the originals are typed letters, memos, etc., with the remainder equally divided between line drawings and half-tones. There are no special requirements for paper stock; however, reduction capability and automatic two-sided copying are both desirable if the cost is not too high.

Based on a preliminary screening, the choice has been narrowed down to two brands: Vendor A and Vendor B.

The purchasing agent has indicated that he is pressed for time which means that you should make a recommendation based on whatever information is currently available, even if you feel that more information would normally be needed.

The information below was given to you by Jim Pierce. He is in charge of an office group consisting of 45 people in product design. He has had first-hand experience with both the A and B machines.

"Based on our experience we've found that the A machine is somewhat slower than the B machine but tends to break down much less. Both pieces of equipment produce fairly good copies as long as you stick to nice sharp originals, but with fuzzy originals the B machine performs better. There isn't that much difference in costs as far as we can see, but we have not done any thorough cost studies either. The people who service the B machine generally get here faster after we call but that is not always the case."

IMF Inc.

Divisional headquarters staff has circulated a memo indicating that a controlled environment, high volume copying/duplicating center is being planned for installation when the staff occupies its new home office building. You have been asked to submit your recommendation for the machine that will best satisfy the requirements listed below.

Anticipated monthly volume is 80,000 copies with an average of 30 copies per original. Approximately 95% of the production will be typed letters and memos, with the other 5% consisting largely of half-tones. The machine selected should be capable of good quality and consistent performance with the paper currently in use and should perform both reduction and automatic two-sided copying. These latter requirements may be waived if cost considerations warrant so doing. Downtime is to be avoided by selecting thoroughly reliable equipment.

The staff memo was delayed in reaching you. However, after doing some quick checking around you found that only two vendors had equipment worth giving serious consideration to; they are vendors X and Y.

Allen Page, who is director of the printing department at the Toledo plant, has passed along the following information about the X and Y machines.

"We do a fair amount of high volume work and so we rely on the X machine more because of its two-sided copying capability. Of course, cost is always important and the Y machine looks good there too. The problem is that neither the X or Y machine is all that fast and we would really like to improve on turn-around time. I must say though that the service reps for the X machine really seem to know what they are doing and don't dilly-dally around getting here. Of course I see them more often too and I wish I din't."

IMF Inc.

Divisional headquarters staff has circulated a memo indicating that a controller environment, high volume copying/duplicating center is being planned for installation when the staff occupies its new home office building. You have been asked to submit your recommendation for the machine that will best satisfy the requirements listed below.

Anticipated monthly volume is 80,000 copies with an average of 30 copies per original. Approximately 95% of the production will be typed letters and memos, with the other 5% consisting largely of half-tones. The machine selected should be capable of good quality and consistent performance with the paper currently in use and should perform both reduction and automatic-two-sided copying. These latter requirements may be waived if cost considerations warrant so doing. Downtime is to be avoided by selecting thoroughly reliable equipment.

The staff memo was delayed in reaching you. However, after doing some quick checking around you found that only two vendors had equipment worth giving serious consideration to; they are vendors X and Y.

Comparison data on the X and Y machines based on surveys of users have been published by Buyers Services Inc., an independent and well respected company. Their findings are summarized below:

Feature	Brand Rating	
	Vendor X	Vendor Y
Copy speed (No. per minute)	70	56
Copy quality:		
typed letter	Good	Very good
half-tone	Good	Poor
Machine breakdowns per month (average)	3.9	1.9
Total cost per copy including supplies (assumes 75,000/month)	2.5¢	2.2¢
Reducing capability	yes	yes
Automatic two-sided copying	yes	no
Maintenance service response time	1½ hours	2 hours
Retrofit update capability	yes	no
Noise level @ 3 feet	79 dba	87 dba
Electricity consumption (in kilowatts)		
Standby:	.6	.3
Operation:	1.1	1.2

General Products Inc.

The purchasing agent in a fabrication plant has requested your recommendation of a walk-up free access bond paper copier to be used by their office staff. He has also supplied the following information:

A monthly volume of 10-12,000 copies is expected, most of which will be 1-3 copies/original. Roughly 75% of the originals are typed letters, memos, etc., with the remainder equally divided between line drawings and half-tones. There are no special requirements for paper stock; however, reduction capability and automatic two-sided copying are both desirable if the cost is not too high.

Based on a preliminary screening, the choice has been narrowed down to two brands: Vendor A and Vendor B.

The purchasing agent has indicated that he is pressed for time which means that you should make a recommendation based on whatever information is currently available, even if you feel that more information would normally be needed.

The comparison data below has been supplied by Mr. Frank Cassady, who is the sales representative for vendor A. This firm has only been in the copier business for a few years and you have spoken to Mr. Cassady only a half dozen times in the past year and a half.

Feature	Brand Rating	
	Vendor A	Vendor B
Copy speed (first copy)	6.0 sec.	4.5 sec.
Copy quality:		
typed letter	Very good	Good-very good
line drawing	Fair-good	Fair-good
half-tone	Fair-poor	Fair-good
Machine breakdowns per month (average)	1.6	3.6
Total cost/copy including supplies (assumes 10,00/month)	4.9¢	5.2¢
Reducing capability	yes	no
Automatic two-sided copying	no	yes
Maintenance service response time (average)	3 hours	55 minutes
Retrofit update capability	yes	yes
Noise level @ 3 feet	90 dba	74 dba
Electricity consumption (in kilowatts)		
Standby:	.2	.4
Operation:	.8	.7

IMF Inc.

Divisional headquarters staff has circulated a memo indicating that a controlled environment, high volume copying/duplicating center is being planned for installation when the staff occupies its new home office building. You have been asked to submit your recommendation for the machine that will best satisfy the requirements listed below.

Anticipated monthly volume is 80,000 copies with an average of 30 copies per original. Approximately 95% of the production will be typed letters and memos, with the other 5% consisting largely of half-tones. The machine selected should be capable of good quality and consistent performance with the paper currently in use and should perform both reduction and automatic two-sided copying. These latter requirements may be waived if cost considerations warrant so doing. Downtime is to be avoided by selecting thoroughly reliable equipment.

The staff memo was delayed in reaching you. However, after doing some quick checking around you found that only two vendors had equipment worth giving serious consideration to; they are vendors X and Y.

Comparison data on the X and Y machines based on surveys of users has been published by Buyers Services Inc., an independent and well respected company. Their findings are summarized below:

Feature	Brand Rating	
	Vendor X	Vendor Y
Copy speed (No. per minute)	70	56
Copy quality:		
typed letter	Good	Very good
half-tone	Good	Poor
Machine breakdowns per month (average)	3.9	1.9
Total cost per copy including supplies (assumes 75,000/month)	2.5¢	2.2¢
Reducing capability	yes	yes
Automatic two-sided copying	yes	no
Maintenance service response time	1½ hours	2 hours

General Products Inc.

The purchasing agent in a fabrication plant has requested your recommendation of a walk-up free access bond paper copier to be used by their office staff. He has also supplied the following information:

A monthly volume of 10-12,000 copies is expected, most of which will be 1-3 copies/original. Roughly 75% of the originals are typed letters, memos, etc., with the remainder equally divided between line drawings and half-tones. There are no special requirements for paper stock; however, reduction capability and automatic two-sided copying are both desirable if the cost is not too high.

Based on a preliminary screening, the choice has been narrowed down to two brands: Vendor A and Vendor B.

The purchasing agent has indicated that he is pressed for time which means that you should make a recommendation based on whatever information would normally be needed.

The comparison data below has been supplied by Mr. Frank Cassady, who is the sales representative for vendor A. This firm has only been in the copier business for a few years and you have spoken to Mr. Cassady only a half dozen times in the past year and a half.

Feature	Brand Rating	
	Vendor A	Vendor B
Copy speed (first copy)	6.0 sec.	4.5 sec.
Copy quality:		
typed letter	Very good	Good-very good
line drawing	Fair-good	Fair-good
half-tone	Fair-poor	Fair-good
Machine breakdowns per month (average)	1.6	3.6
Total cost/copy including supplies (assumes 10,000/month)	4.9¢	5.2¢
Reducing capability	yes	no
Automatic two-sided copying	no	yes
Maintenance service response time (average)	3 hours	55 minutes

APPENDIX 6

APPENDIX 6

Part I

Instructions: Based on the information you now have please evaluate the two brands by dividing 10 points between them for each question. Make sure the points add to 10 on each line and that you give at least one point to each brand. The more points you give to one brand the better your opinion of it is.

Example:	Vendor X	Vendor Y
0. Reliable Delivery	8	2
1. Product Features		
2. Maintenance Services		
3. Reliability		
4. Total Cost		
5. Additional Features		
6. Overall Acceptability		
7. Overall Desirability		
8. Likelihood you would recommend		

9. Which copier would you recommend? (Circle one)

   1. Vendor X
   2. Vendor Y

How important was each of the following factors to you in making your decision? (Please circle one number for each factor.)

	Very High Importance						Very Low Importance
10. Product Features	7	6	5	4	3	2	1
11. Maintenance Services	7	6	5	4	3	2	1
12. Reliability	7	6	5	4	3	2	1
13. Total Cost	7	6	5	4	3	2	1
14. Additional Features	7	6	5	4	3	2	1

Part II

The following questions concern your personal judgment and feelings about the decision you have just made. Please answer all questions by circling one number only.

15. How trustworthy do you think the source of your information is?

Very Trustworthy	7	6	5	4	3	2	1	Not Trust-worthy At All

16. How reliable do you think the source of your information is?

Very Reliable	7	6	5	4	3	2	1	Not Reliable At All

17. How knowledgeable do you think the source of your information is?

Very Knowledgeable	7	6	5	4	3	2	1	Not Knowledge-able At All

18. How competent do you think the source of your information is?

Very Competent	7	6	5	4	3	2	1	Not Competent At All

19. How confident are you that you have made the best choice?

Very Confident	7	6	5	4	3	2	1	Not Confident At All

20. How sure are you that you have analyzed the problem correctly?

Very Sure	7	6	5	4	3	2	1	Not Sure At All

21. How strongly do you feel you have made a correct decision?

Very Strongly	7	6	5	4	3	2	1	Not Strongly At All

* *

DO NOT GO ON TO PART III UNTIL AFTER YOU HAVE DISCUSSED THE CASE AS A GROUP!!!

Part III

Instructions. Based on the information you now have please evaluate the two brands by dividing 10 points between them for each question. Make sure the points add to 10 on each line and that you give at least one point to each brand. The more points you give to one brand the better your opinion of it is.

Example:	Vendor X	Vendor Y
0. Reliable Delivery	8	2
22. Product Features		
23. Maintenance Services		
24. Reliability		
25. Total Cost		
26. Additional Features		
27. Overall Acceptability		
28. Overall Desirability		
29. Likelihood you would recommend		

30. Which copier would you recommend? (Circle one)

    1. Vendor X
    2. Vendor Y

How important was each of the following factors to you in making your decision? (Please circle one number for each factor.)

	Very High Importance						Very Low Importance
31. Product Features	7	6	5	4	3	2	1
32. Maintenance Services	7	6	5	4	3	2	1
33. Reliability	7	6	5	4	3	2	1
34. Total Cost	7	6	5	4	3	2	1
35. Additional Features	7	6	5	4	3	2	1

Part IV

Please evaluate _____ by circling the one number for each question that best expresses your opinion.

		Agree Completely						Disagree Completely
36.	Very talkative in discussion just now.	7	6	5	4	3	2	1
37.	Very influential in determining group choice.	7	6	5	4	3	2	1
38.	Very persuasive in presenting ideas.	7	6	5	4	3	2	1
39.	Argued strongly for choice of one vendor over the other.	7	6	5	4	3	2	1
40.	Leader of the group in today's discussion.	7	6	5	4	3	2	1

APPENDIX 7

APPENDIX 7

The causal model does not specify relationships between independent factors and individual attribute vendor evaluations. However it does postulate relationships with overall vendor preference. Since these overall preferences are based on the attribute evaluations, we may look at these to detect sources of difference.

The dependent variables are respectively, product features, maintenance services, delivery, cost and vendor reputation. Tables 23 through 27 present summary ANOVA tables for the impact of information distribution, source credibility and claim strength on each of these dependent variables.

Table 23

Student Sample Product Features ANOVA Summary

Effect	Mean Square	F	Significance
ID x SC x CI	0.000	0.000	.99
SC x CI	0.374	0.533	.47
ID x CI	0.125	0.178	.68
ID x SC	0.000	0.000	.99
CI	3.248	4.631	.04*
SC	1.004	1.432	.24
ID	3.430	4.891	.04*

*Significant at $p \leq .10$

Table 24

Student Sample Maintenance Services ANOVA Summary

Effect	Mean Square	F	Significance
ID x SC x CI	0.020	0.012	.91
SC x CI	0.072	0.043	.84
ID x CI	1.692	1.021	.32
ID x SC	0.423	0.255	.62
CI	4.071	2.456	.12
SC	1.430	0.863	.63
ID	3.678	2.219	.14

Table 25

Student Sample Delivery ANOVA Summary

Effect	Mean Square	F	Significance
ID x SC x CI	0.058	0.062	.81
SC x CI	1.512	1.610	.21
ID x CI	0.508	0.541	.47
ID x SC	3.164	3.370	.07*
CI	0.026	0.028	.87
SC	0.846	0.901	.35
ID	7.360	7.839	.01**

*Significant at $p \leq .10$
**Uninterpretable due to presence of significant interaction

Table 26

Student Sample Total Cost ANOVA Summary

Effect	Mean Square	F	Significance
ID x SC x CI	0.081	0.095	.76
SC x CI	0.076	0.090	.77
ID x CI	0.000	0.000	.99
ID x SC	0.592	0.700	.41
CI	0.981	1.160	.29
SC	3.363	3.976	.05*
ID	0.000	0.000	.99

*Significant at $p \leq .10$

Table 27

Student Sample Vendor Reputation ANOVA Summary

Effect	Mean Square	F	Significance
ID x SC x CI	0.254	0.140	.71
SC x CI	2.732	1.509	.23
ID x CI	3.652	2.018	.16
ID x SC	0.093	0.051	.82
CI	0.135	0.075	.79
SC	14.319	7.912	.01*
ID	3.872	2.139	.15

*Significant at $p \leq .10$

APPENDIX 8

APPENDIX 8

The primary quantitative measure of quality of operationalization is a design's power. Power is a positive function of the number of subjects, the magnitude of treatment effects and the size of the alpha selected for significance testing. It is also an inverse function of uncontrolled variance. Power is the probability of correctly rejecting the null hypothesis and is usually represented as,

$$\text{Power} = 1 - \beta \qquad \{1\}$$

where β is the probability of a Type II error.

A Type II error occurs when one fails to reject the null hypothesis of no treatment differences when real differences do exist. Assuming that estimates of treatment effect sizes are available the principal use of the power equation is an a priori determination of the sample size needed to be able to detect those effects. While estimates of treatment effects were not available prior to this investigation they are now available for future reference. An example is worked out below for a single factor experiment. Power is determined by first calculating a non-centrality parameter, ϕ^2.

$$\phi^2_A = \frac{S\left|\sum(\mu_i-\mu)^2\right|^2/a}{\sigma^2 \text{ error}} \qquad \{2\}$$

Where ϕ^2_A = the parameter for an effect A,

S = the sample size,

μ_i = the treatment cell means,

μ = the overall mean,

a = the number of treatment levels

σ^2 error = within cells error variance.

The value of ϕ^2 may be altered by substituting various sample sizes into the above equation. These ϕ values are then compared to power functions determined by the chosen α level and numerator and denominator degrees of freedom. The ϕ value intersecting a minimal level of power will then indicate a minimal sample size.

In the present case, the student sample data for item 32 reveals that,

given $\mu = 4.64$ $\mu_1 = 3.75$ $\mu_2 = 5.38$

$a = 2$ $\sigma_A^2 = 2.29$

$$\text{Then } \phi_A^2 = \frac{S\left|(.89)^2 + (.74)^2\right|/2}{2.29} \quad \{3\}$$

$$\phi_A^2 = (S)(.292) \quad \{4\}$$

$$\phi_A = .54\sqrt{S-1} \quad \{5\}$$

Now assuming that the desired $\sigma = .05$ and power = .80, could that level of power be obtained by choosing S = 18?

When S = 18, $\phi_A = 2.3$ and power = .63 and so the desired level of power could not be obtained with that sample size, in fact to achieve power = .80 the sample size under these conditions would have to be at least 23. If three person groups were the level of analysis then a total of 69 subjects would be needed.

For item 32, vendor desirability, the main effect for source credibility was significant at $\sigma = .04$ and with a sample size of 64 groups and $\phi_A = .43$ the actual power of the design was >.99. Thus if the effect size were reliably known in advance a much smaller sample size could have been used.

BIBLIOGRAPHY

BIBLIOGRAPHY

Norman H. Anderson, "Integration Theory and Attitude Change." Psychological Review, 78 (May 1971), 171-206.

Norman H. Anderson and Cheryl C. Graesser, "An Information Integration Analysis of Attitude Change in Group Discussion." Journal of Personality and Social Psychology, 34 (August 1976), 210-22.

Solomon E. Asch, "Effects of Group Pressure Upon the Modification and Distortion of Judgements." in Readings in Social Psychology, E. Maccoby (ed.), New York: Holt, Rinehart & Winston (1958).

Richard P. Bagozzi, "Exchange and Decision Processes in the Buying Center." in Organizational Buying Behavior, T. V. Bonoma and G. Zaltman (eds.), Chicago: American Marketing Association (1978).

Richard P. Bagozzi, "Structural Equation Models in Experimental Research." Journal of Marketing Research, 14 (May 1977), 209-26.

R. F. Bales, F. L. Strodtbeck, T. M. Mills and M. E. Roseborough, "Channels of Communication in Small Groups." American Sociological Review, 16 (1951), 461-8.

Raymond A. Bauer, "Consumer Behavior as Risk Taking." in Proceedings, R. S. Hancock (ed.), Chicago: American Marketing Association (1960).

George D. Bishop and David G. Myers, "Informational Influence in Group Discussion." Organizational Behavior and Human Performance, 12 (1974), 92-104.

M. Burgoon and M. Ruffner, Human Communication, New York: Holt, Rinehart & Winston (1978).

M. Burgoon and D. Stewart, "Empirical Investigations of Language Intensity: I. The Effects of Sex of Source, Receiver and Language Intensity on Attitude Change." Human Communications Research, 1 (1975), 244-8.

Peter J. Burke, "Participation and Leadership in Small Groups." American Sociological Review, 39 (1974), 832-43.

P. Busch and D. T. Wilson, "An Experimental Analysis of a Salesman's Expert and Referent Bases of Social Power in a Buyer-Seller Dyad." Journal of Marketing Research, 13 (February 1976), 3-11.

Bobby J. Calder, "A Methodology for Research on Organizational Buyer Behavior." in Organizational Buying Behavior, T. V. Bonoma and G. Zaltman (eds.), Chicago: American Marketing Association (1978).

J. C. Campbell and D. T. Stanley, Experimental and Quasi-Experimental Designs for Research, Chicago: Rand McNally (1966).

Richard N. Cardozo and James Cagley, "Experimental Study of Industrial Buyer Behavior." Journal of Marketing Research, 8 (August 1971), 329-34.

James S. Coleman, The Mathematics of Collective Action, Chicago: Aldine Press (1973).

Barry E. Collins and Harold Guetzkow, A Social Psychology of Group Processes for Decision Making, New York: John Wiley & Sons (1964).

Paul D. Converse, The Elements of Marketing, New York: Prentice-Hall (1930).

James R. Cooley, An Analysis of Relative Power Among Participants in the Purchase of Industrial Components, Unpublished DBA Thesis, Arizona State University (1976).

James R. Cooley, Donald W. Jackson and Lonnie L. Ostrom, "Analyzing the Relative Power of Participants in Industrial Buying Decisions." in Proceedings, Educator's Conference, Chicago: American Marketing Association (1977).

Melvin T. Copeland, "Buying Motives for Industrial Goods." Harvard Business Review, 2 (April 1924), 303.

Melvin T. Copeland, Principles of Merchandising, Chicago: A. W. Shaw Co. (1925).

Donald F. Cox, Risk Taking and Information Handling in Consumer Behavior, Boston: Harvard University Press (1967).

Joseph F. Dash, Leon Schiffman and Conrad Berenson, "Risk and Personality-Related Dimensions of Store Choice." Journal of Marketing, 40 (January 1976), 32-9.

Morton Deutsch and Harold Gerard, "A Study of Normative and Informational Social Influences upon Individual Judgement." Journal of Abnormal and Social Psychology, 51 (1955), 629-36.

Robert Dubin, Theory Building, New York: Free Press (1969).

W. Erbe, "Gregariousness, Group Membership and the Flow of Information." American Journal of Sociology, 67 (1962), 502-16.

N. Feldman and R. N. Cardozo, "Industrial Buying as Consumer Behavior." in Proceedings, Educators' Conference, Chicago: American Marketing Association (1976).

Wade Ferguson, "A Critical Review of Recent Organizational Buying Research." Industrial Marketing Management, 7 (1978), 225-30.

Jeremy Finn, A General Model for Multivariate Analysis, New York: Holt, Rinehart & Winston (1974).

B. Aubrey Fisher, Small Group Decision Making: Communication and the Group Process, New York: McGraw-Hill Book Co. (1974).

J. D. Ford, Jr., "Some Factors Affecting the Behavior of Emergent and Designated Leaders in Smaller Problem-Solving Groups." American Psychologist, 16 (1961), 389.

John R. P. French, "A Formal Theory of Social Power." The Psychological Review, 63 (1956), 181-94.

John R. P. French and Bertram Raven, "The Bases of Social Power." in Studies in Social Power, D. Cartwright (ed.), Ann Arbor: Institute for Social Research (1959).

B. G. Glaser and A. L. Strauss, The Discovery of Grounded Theory: Strategies for Qualitative Research, Chicago: Aldine Publishing Co. (1967).

Ronald M. Gorman, "Role Conception and Purchasing Behavior." Journal of Purchasing and Material Management (February 1971), 57-71.

Gary Griksheit and W. J. E. Crissy, "Improving Interpersonal Communications Skill." MSU Business Topics, 21 (Autumn 1973), 63-8.

Kjell Grønhaug, "Autonomous vs. Joint Decisions in Organizational Buying." Industrial Marketing Management, 4 (1975), 265-71.

Kjell Grønhaug, "Exploring Environmental Influences in Organizational Buying." Journal of Marketing Research, 13 (August 1976), 225-9.

J. R. Hackman and C. G. Morris, "Group Tasks, Group Interaction Process, and Group Performance Effectiveness: A Review and Proposed Integration." in Advances in Experimental Social Psychology, v.8, New York: Academic Press (1975).

Hakan Hakansson and Bjorn Wootz, "Supplier Selection in an International Environment: An Experimental Study." Journal of Marketing Research, 12 (August 1975), 46-51.

W. L. Hays, Statistics for the Social Sciences, 2nd ed., New York: Holt, Rinehart & Winston (1973).

J. K. Hemphill and C. B. McConville, "The Effects of Communication Restraints upon Mutual Problem-Solving Behavior." American Psychologist, 17 (1962), 335.

L. R. Hoffman, "Group Problem Solving." in Advances in Experimental Social Psychology, v.2, New York: Academic Press (1965).

Carl I. Hovland and Walter Weiss, "The Influence of Source Credibility on Communication Effectiveness." Public Opinion Quarterly (Winter 1951-52), 635-50.

John A. Howard and J. Sheth, The Theory of Buyer Behavior, New York: John Wiley & Sons (1969).

James Hulbert and Noel Capon, "Interpersonal Communication in Marketing: An Overview." Journal of Marketing Research, 9 (February 1972) 27-34.

Micheal D. Hutt, The New Product Selection Process of Retail Buying Committees: An Analysis of Group Decision Making, Unpublished Ph.D. Thesis, Michigan State University (1975).

Daniel Johnson and Robert Andrews, "Risky Shift Phenomenon Tested with Consumer Products as Stimuli." Journal of Personality and Social Psychology, 20 (December 1971), 382-5.

David Johnson and Larry Ridener, "Self-Disclosure, Participation and Perceived Cohesiveness in Small Group Interaction." Psychological Reporter, 35 (1974), 361-2.

H. H. Kelley and John Thibaut, "Group Problem Solving." in The Handbook of Social Psychology, G. Lindzey and E. Aronson (eds.), v.4, Reading, Massachusetts: Addison-Wesley Publishing Co. (1969).

G. Keppel, Design and Analysis: A Researcher's Handbook, Englewood Cliffs, N.J.: Prentice-Hall (1973).

G. E. Kiser, C. P. Rao and S. R. G. Rao, "Vendor Attribute Evaluations of 'Buying Center' Members Other than Purchasing Executives." Industrial Marketing Management, 4 (1975), 45-54.

Robert Krapfel, "A Decision Process Approach to Modeling Organizational Buyer Behavior." Proceedings, Educator's Conference, Chicago: American Marketing Association (1978).

D. R. Lambert, R. J. Dornhoff and J. B. Kernan, "The Industrial Buyer and the Postchoice Evaluation Process." Journal of Marketing Research, 14 (May 1977), 246-51.

D. R. Lehman and John O'Shaughnessy, "Difference in Attribute Importance for Different Industrial Products." Journal of Marketing, 38 (April 1974), 36-42.

Theodore Levitt, "Communications and Industrial Selling." Journal of Marketing, 31 (April 1967), 15-21.

Theodore Levitt, Industrial Purchasing Behavior: A Study of Communication Effects, Boston: Harvard University, Graduate School of Business Administration (1965).

John A. Martilla, "Word of Mouth Communication in the Industrial Adoption Process." Journal of Marketing Research, 8 (May 1971), 173-8.

H. L. Mathews, D. T. Wilson and J. F. Monoky, Jr., "Bargaining Behavior in a Buyer-Seller Dyad." Journal of Marketing Research, 9 (February 1972), 103-5.

H. H. Maynard, W. C. Weidler and T. N. Beckman, Principles of Marketing, New York: The Ronald Press (1939).

Micheal Mazis, "Decision Making Role and Information Processing." Journal of Marketing Research, 9 (November 1972), 447.

E. J. McCarthy, Basic Marketing, 5th ed., Homewood, Illinois: Richard D. Irwin (1978).

W. J. McEwen and Bradley S. Greenberg, "The Effects of Message Intensity on Receiver Evaluation of Source, Message and Topic." Journal of Communication, 20 (1970), 340-50.

Joseph E. McGrath and I. Altman, Small Group Research: A Synthesis and Critique of the Field, New York: Holt, Rinehart & Winston (1966).

James R. McMillan, "Role Differentiation in Industrial Buying Decisions." in Combined Proceedings, Chicago: American Marketing Association (1973).

James R. McMillan, "The Role of Perceived Risk in Industrial Marketing Decisions." Proceedings, Chicago: American Marketing Association (1973).

James R. McMillan, "Industrial Buyer Behavior as Group Decision Making." Paper presented at Nineteenth International Meeting of the Institute of Decision Sciences (April 1972).

Cyril P. Morgan and John Aram, "The Preponderance of Arguments in the Risky Shift Phenomenon." Journal of Experimental Social Psychology, 11 (January 1975), 25-34.

Jum C. Nunnally, Psychometric Theory, New York: McGraw-Hill Book Co. (1967).

Jum C. Nunnally, Psychometric Theory, 2nd ed., New York: McGraw-Hill Book Co. (1978).

Lyman E. Ostlund, "Role Theory and Group Dynamics." in Consumer Behavior: Theoretical Sources, Scott Ward and Thomas Robertson (eds.), Englewood Cliffs, N.J.: Prentice-Hall (1973).

B. R. Patton and K. Giffin, Problem-Solving Group Interaction, New York: Harper & Row (1973).

Gerry Philipsen and T. J. Saine, "The Effect of Reward Criteria on Verbal Participation in Group Discussion." Speech Monographs, 40 (1973), 151-3.

Dean G. Pruitt, "Conclusions: Toward an Understanding of Choice Shifts in Group Discussion." Journal of Personality and Social Psychology, 20 (1971), 495-510.

Peter H. Reingen, "Risk-taking by Individuals and Informal Groups with the Use of Industrial Product Purchasing Situations as Stimuli." Journal of Psychology, 85 (November 1973), 339-45.

Peter H. Reingen, "The Risky-Shift in Ad Hoc and Natural Consumer Groups: A Test of the Polarization Hypothesis and a Majority-Rule Explanation." Advances in Consumer Research, 5 (1978), 87-92.

H. W. Riecken, "The Effect of Talkativeness on Ability to Influence Group Solutions of Problems." Sociometry, 21 (1958), 309-21.

Patrick J. Robinson, Charles Faris and Yoram Wind, Industrial Buying and Creative Marketing, Boston: Allyn & Bacon (1967).

Jerome Scott and Peter Wright, "Modeling an Organizational Buyer's Product Evaluation Strategy: Validity and Procedural Considerations." Journal of Marketing Research, 13 (August 1976), 211-24.

M. E. Shaw, "Some Factors Influencing the Use of Information in Small Groups." Psychology Reporter, 8 (1961), 187-98.

Jagdish Sheth, "A Model of Industrial Buyer Behavior." Journal of Marketing, 37 (October 1973), 50-6.

Robert Spekman and Bobby J. Calder, "Narrowing the Conceptual-Empirical Gap in Organizational Buyer Behavior." Advances in Consumer Research, 5 (1978), 653-6.

F. F. Stephan and E. G. Mishler, "The Distribution of Participation in Small Groups." American Sociological Review, 17 (1952), 608.

E. J. Thomas and C. F. Fink, "Models of Group Problem Solving." Journal of Abnormal Social Psychology, 63 (1961), 53-63.

Amiram Vinokur, "Review and Theoretical Analysis of the Effects of Group Processes upon Individual and Group Decisions Involving Risk." Psychological Bulletin, 76 (1971), 231-50.

Amiram Vinokur, Y. Trope and E. Burnstein, "A Decision-Making Analysis of Persuasive Argumentation and the Choice Shift Effect." Journal of Experimental Social Psychology, 11 (1975), 127-48.

Amiram Vinokur and Eugene Burnstein, "Effects of Partially Shared Persuasive Arguments on Group Induced Shifts: A Group Problem-Solving Approach." Journal of Personality and Social Psychology, 29 (1974), 305-15.

M. A. Wallach, N. Kogan and D. J. Bem, "Group Influence on Individual Risk Taking." Journal of Abnormal and Social Psychology, 65 (1962), 76-86.

Frederick E. Webster, Jr., "Industrial Buyer Behavior: A State of the Art Appraisal." Proceedings, Chicago: American Marketing Association (1969).

Frederick E. Webster, Jr., "Informal Communication in Industrial Markets." Journal of Marketing Research, 7 (May 1970), 186-9.

Frederick E. Webster, Jr., "Interpersonal Communication and Salesman Effectiveness." Journal of Marketing, 32 (July 1968), 7-13.

Frederick E. Webster, Jr., "Modeling the Industrial Buying Process." Journal of Marketing Research, 2 (November 1965), 370-6.

Frederick E. Webster, Jr., "On the Applicability of Communication Theory to Industrial Markets." Journal of Marketing Research, 5 (November 1968), 426-8.

Frederick E. Webster, Jr. and Yoram Wind, Organizational Buyer Behavior, Englewood Cliffs, N.J.: Prentice-Hall (1972).

R. E. Weigand, "Identifying Industrial Buying Responsibility." Journal of Marketing Research, 3 (February 1966), 81-4.

David T. Wilson, "Dyadic Interactions: Some Conceptualizations." in Organizational Buying Behavior, T. V. Bonoma and Gerald Zaltman (eds.), Chicago: American Marketing Association (1978).

David T. Wilson, "Models of Organization Buyer Behavior: Some Observations." in Buyer/Consumer Information Processing, G. D. Hughes and D. L. Ray (eds.), Chapel Hill, North Carolina: The University of North Carolina Press (1974).

David T. Wilson, "Research Approaches to Multi-Participant Decision Processes." Advances in Consumer Research, 5 (1978), 641.

Yoram Wind, Industrial Buying Behavior: Source Loyalty in the Purchase of Industrial Components, Unpublished Ph.D. Dissertation, Stanford University (1966).

Yoram Wind, "Industrial Source Loyalty." Journal of Marketing Research, 7 (1970), 450-7.

Yoram Wind, "Recent Approaches to the Study of Organizational Buyer Behavior." Proceedings, Chicago: American Marketing Association (1974).

Arch G. Woodside, "Informal Group Influence on Risk Taking." Journal of Marketing Research, 9 (May 1972), 223-5.

Gerald Zaltman and T. V. Bonoma, "Organizational Buying Behavior: Hypotheses and Directions." Industrial Marketing Management, 6 (1977), 53-60.