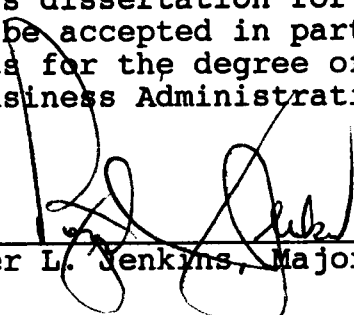
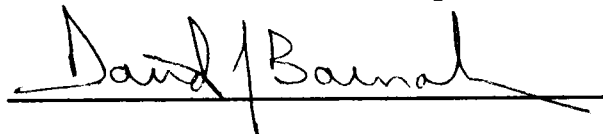


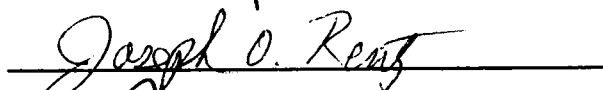
To the Graduate Council:

I am submitting herewith a dissertation written by Jeonpyo Noh entitled "An Investigation of Risk Propensity and the Risk Handling Process in Industrial Marketing." I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Business Administration.


Roger L. Jenkins, Major Professor

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and recommend its acceptance:


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Vice Provost
and Dean of the Graduate School

AN INVESTIGATION OF RISK PROPENSITY AND THE RISK HANDLING
PROCESS IN INDUSTRIAL MARKETING

A Dissertation

Presented for the

Doctor of Philosophy

Degree

The University of Tennessee, Knoxville

Jeonpyo Noh

December 1988

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ABSTRACT

A considerable body of literature has emerged suggesting that perceived risk and the risk reduction behavior are important in the industrial vendor selection process. Yet, relatively few studies have been published concerning the relationship between risk propensity and the risk handling process of industrial purchasing professionals in a comprehensive manner.

The purposes of this study are to better understand risk propensity and the risk handling process of industrial purchasing professionals, and to propose a model that would guide future research on risk, especially in the industrial marketing area. The proposed model integrates risk propensity, factors affecting risk propensity, the risk handling process, and factors influencing the risk handling process.

Data was collected through a mail survey which collected data from a national sample of the purchasing professionals in the chemical industry. The data collected was analyzed to examine the relationships between (1) risk propensity and the risk handling process, (2) the risk handling process and the supplier related factors influencing the risk handling process, and (3) correlates of risk propensity.

The results indicated that involvement and source loyalty were better discriminators among those groups classified based on the employment of risk handling strategies. Perceived image and source credibility, however, turned to be insignificant discriminators.

There existed significant relationships between perceived risk and the following supplier related factors: perceived image, source loyalty, and source credibility. No significant association could be found between perceived risk and involvement.

Only the number of years purchasing experience revealed a significant relationship with risk propensity. Quite possibly, the measurement of risk propensity might invalidate the role of risk propensity in the proposed model.

The information provided from this study can be beneficial to both practitioners and academicians that have an interest in either the theoretical foundations which were developed, or the application of perceived risk and the risk handling process.

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CHAPTER I

INTRODUCTION

The Problem

Industrial marketing has been called "the sleeping giant" in that the volume of industrial marketing transactions among firms far exceeds that of consumer marketing (Webster and Wind 1980). However, despite of the importance of the field, the area has received little attention in comparison to consumer marketing. There exists a dearth of industrial marketing examples in the marketing literature and also a lack of scholarly attention being directed toward thorough understanding of industrial buying behavior. In fact, the complexity of industrial buying has long been recognized and probably contributes implicitly to some of the neglect of industrial marketing. Consequently, as Moriarty (1983) pointed out, industrial marketing is considerably less well developed than consumer marketing. Moriarty (1983) suggested that many improvements should be made in industrial marketing scholarship to enable academics to understand industrial marketing with enough depth to be useful, and to enable practitioners to market their products and services more efficiently and effectively.

Much more research is essential in the industrial marketing area, not only for the development of new concepts, models, and approaches unique to the industrial case, but also for the advancement of the science of marketing in general.

Conceptually, many of the concepts, models, and approaches in consumer marketing can be applied to industrial marketing (Webster and Wind 1980). They cogently argued that the advancement of the industrial marketing discipline can be achieved by allowing the testing of consumer-based marketing concepts in an industrial environment.

Among the consumer-based concepts, the element of perceived risk in decision-making has been actively applied and examined. Traditionally, the industrial buying process has generally been conceptualized as involving objective and rational evaluations of the available alternatives (Hill et al. 1975). Industrial buyers were originally assumed to maximize expected payoff as well. This rational model has long been used to illustrate the differences between consumer buying which has been portrayed as more irrational and industrial buying which has been portrayed to be more rational. Some researchers (e.g., Sheth 1973), however, have challenged the assumption of such an economically rational choice model of industrial buying behavior. They have proposed complex models of industrial

buying behavior that incorporate many psychological influences which involve behavioral and perceptual variables (Choffray and Lilien 1978; Sheth 1973; Webster and Wind 1972).

Over the past 20 years, the element of perceived risk has been incorporated into many models of industrial buying behavior (Levitt 1965; Webster and Wind 1972; Sheth 1973), and empirical studies also show that perceived risk and the choice of risk handling strategies have had significant influence on industrial buying decisions (Sweeney, Mathews, and Wilson 1973; Peters and Venkatesan 1973).

There exist many studies examining the role of perceived risk either in consumer buying or industrial purchasing. As Dowling (1986) pointed out, perceived risk stimulates information search and risk handling strategies, which consequently have an impact upon choice. At the same time, a considerable body of literature has emerged suggesting that the perception of risk and the risk reduction or avoidance behavior are important influencing factors on the industrial vendor selection process (e.g., Sweeney et al. 1973). Yet, relatively few studies have been published concerning the relationship between risk propensity and the risk handling process of industrial purchasing professionals in a comprehensive manner.

Additionally, the construct of perceived risk has been confused with the concept of risk propensity in

consumer research. For example, Cunningham (1967) treated the construct of perceived risk as a personality variable. However, it would appear that perceived risk is dependent upon a specific situation whose context determines the degree of perceived risk. Dowling (1985) also appeared to be confused in distinguishing risk propensity from perceived risk by introducing the Kogan and Wallach's Instrument as a measure of perceived risk. Undoubtedly, the Kogan and Wallach's Instrument was intended to measure people's general propensity toward risk, not the degree of risk perceived in a given context. As Blaylock (1985) highlighted this issue, the perception of risk should be differentiated from either an objective amount of risk or propensity toward risk. Clearly, how people perceive a risky situation (perceived risk) is quite different from how they view themselves (risk propensity).

Purpose of the Study

The main purposes of this study are (1) to more fully understand risk propensity and the risk handling process of industrial purchasing professionals, (2) to examine the interrelationship between risk propensity and the risk handling process, and (3) to propose a model that would guide future research on risk propensity and risk handling, especially in the industrial marketing area.

In order to achieve these purposes, five specific steps will be taken. First, a conceptual model of risk propensity and the risk handling process for industrial purchasing professionals is proposed which integrates (1) risk propensity, (2) factors affecting risk propensity, (3) the actual risk handling process, and (4) supplier related factors mediating the risk handling process. The model serves as a framework to test hypotheses about the interrelationships among those four components. Second, the risk propensity of the industrial purchasing professionals was measured. Third, personal, financial, business, and industrial correlates of risk propensity of the industrial purchasing professionals were investigated. Fourth, the influences of the industrial purchasing professionals risk propensity on perceived risk and the strategies which they adopted to cope with risks in the purchasing situation were studied. Finally, the influences of the supplier related factors mediating the risk handling process on perceived risk and the risk handling strategies were investigated.

Significance of the Study

The importance and the potential contributions of this research are addressed next. First, this research reexamines the constructs of perceived risk and risk propensity and establishes the relationship between these

two constructs in the industrial marketing arena. By examining the effect on the risk taking process of the risk propensity of industrial purchasing decision makers, this study better enables us to better comprehend the constructs of perceived risk and risk handling process and the interaction between the two concepts. Additionally, this study clarifies the distinction between buyer's personal risk (risk propensity) and organizational risk (perceived risk). There exists no comprehensive research which clarifies the relationship between risk propensity and the risk handling process for organizational buyers. By breaking down risk into perceived risk and risk propensity, this research helps to make a clear distinction between these two constructs.

Second, this research helps to facilitate the transfer of consumer-behavior related theories, concepts, and methods into the industrial marketing field. By applying the concept of perceived risk and risk taking behavior to industrial purchasing decision-making situations, this study plays an important role in extending the realm of research in the industrial marketing.

Third, this study provides a comprehensive framework for examining the risk handling process of industrial purchasing decision makers. By investigating important factors mediating the risk taking process in the industrial purchasing situations and by considering industrial

purchasing decisions as risk taking, this research broadens our perspectives on the decision-making process of industrial purchasing managers.

Fourth, this research provides useful guidelines for management of vendors for manufacturing and industrial buyers. Careful selection and monitoring of vendors is a necessary first step toward ensuring reliable and defect-free production (Garvin 1984), and this study should help manufacturing and industrial buyers to better select and control vendors.

Finally, this study helps industrial marketers to better plan and perform, and to control their marketing strategies. By a thorough understanding of the risk propensity and risk handling processes of industrial purchasing managers, industrial marketers should be able to more successfully execute their marketing strategies on their target markets.

Scope of the Study

The study was confined to the chemical industry. Mail questionnaires were sent to industrial buyers drawn from the membership roster of the Chemical Division of the National Association of Purchasing Management (N.A.P.M.).

The study was also limited to a single-decision participant. Considering the exploratory nature of the study, the present research did not take it into

consideration that an industrial buying decision is often the result of a number of members from different sources in the buying center.

To focus the research on actual industrial buying behavior rather than potential buying behavior, the retrospective buying decision has been investigated. The study of actual purchasing behavior presents more realistic views of decision process.

Organization of the Study

Chapter II reviews literature concerning (1) risk propensity, (2) perceived risk, (3) risk handling strategy, (4) supplier related factors mediating the risk handling process, and (5) risk handling models. This chapter ends by proposing a conceptual model of risk propensity and the risk handling process for industrial purchasing.

Chapter III presents the research hypotheses and related research questions, and methodological procedures to empirically test these proposed hypotheses. The measures of the key constructs are discussed and the research variables are operationally defined.

Chapter IV presents the results of the analyses. The conclusions of the study are reported and discussed, as well.

Chapter V deals a discussion of the findings. The potential significance of the study is also discussed. The

possible limitations of the study are presented. Finally, future research issues are addressed both in conceptual and methodological dimensions.

CHAPTER II

LITERATURE REVIEW

Introduction

This chapter is divided into five sections. In the first section, literature on risk propensity is reviewed. The second section presents literature concerning perceived risk. In the third section, literature on risk handling strategies is examined. Next, literature regarding supplier related factors mediating the risk handling process is explored. Finally, literature on extant risk handling models is reviewed. A conceptual model of risk propensity and the risk handling process for industrial purchasing professionals is proposed to serve as a research framework.

Risk Propensity Literature

There exists an extensive body of literature on risk propensity. Risk propensity is generally defined either as attitude toward risks or as willingness to take risks (Kogan and Wallach 1964; MacCrimmon and Wehrung 1986).

Traditionally, many researchers have assumed that risk propensity is a general psychological disposition; that is, individuals are inclined in varying degrees to take risks and that this tendency is generalizable across

situations and types of risks. For example, Bourne and Ekstrand (1982) defined risk propensity as "permanent characteristics of an individual that he tends to show in most situations."

However, this traditional assumption of risk propensity has been challenged by several studies which have reported a lack of convergent validity among various risk propensity measures. Slovic (1962), for example, administered a battery of nine different measures of risk propensity to a group of subjects and, in general, found nonsignificant correlations between the various measures. He also concluded that willingness to take risks may not be a general trait at all but rather one which varies from situation to situation with the same individual. Slovic (1964) also reported that the lack of agreement among the measures of risk propensity might be due to the multidimensionality of risk and its subjectivity. Kogan and Wallach (1967) reinforced Slovic's claim in their summary of the various determinants of risk taking with special emphasis on the situational influences. They argued that risk taking propensity is situational with multidimensional characteristics, even though there exists no consensus on its nature. Similarly, Jackson et al. (1972) generated and tested a number of hypotheses to explain why the various risk propensity measures do not correlate with one another. One hypothesis was there

indeed may be no general risk propensity. Risk propensity varies with the individual from task to task. Importantly, much remains to be discovered about attitude toward risks, but there does seem to exist a consensus on the aspect of situational determinants of risk propensity. There is no a priori reason to believe that a person who takes risks in one situation will necessarily take risks in all situations. As previously indicated, the situational characteristic of risk propensity has also been confirmed by some studies indicating lack of agreement on different measures of risk propensity (Weinstein 1969; Higbee 1971).

Given the situational determinants of risk propensity, major common denominators on which each risky situation can be analyzed have been studied. These denominators involve degree of control, reality of the decision, motivation, environment, amount of information, and experience. The first situational determinant of risk propensity to be considered is the degree of control. MacCrimmon and Wehrung (1986) asserted that lack of control would occur due to either lack of information or lack of time. Especially in most business situations, skill seems more significant than luck in influencing the outcome of a task, even though the outcome depends on the pure chance in some situations. Bem (1971) suggested that the degree of control which the decision-maker perceives is important since one may be disposed to take risks when led to believe

that he can exert some control over outcomes. Relating this to the industrial purchasing situation, the industrial purchasing decision maker would be expected to take risks in the purchasing situation where he can employ his skill and exert control over suppliers.

The "reality of the decision" might also be considered another situational determinant of risk propensity. A given individual might be expected to express a greater tolerance of risk in a hypothetical situation as opposed to a real-life situation. Thus, the success in eliciting actual risk preferences from hypothetical questions depends on such factors as the sincerity of the subject, the realism of the questions, and the degree to which the subject can relate to a particular question. Slovic (1969) found that when decisions were hypothetical, subjects maximized gain and discounted the possibilities of loss. However, when the subjects knew they would have to play their preferred gambles, they were more cautious, preferring better odds and smaller losses than when in the hypothetical situation. Certainly caution should be used in predicting real risk taking propensity from measures of hypothetical risk.

Another situational determinant of risk propensity is the actual motivation inherent in the risky situation. There must be some reward before one will face the risks of a situation. At the same time, there is always the chance

of losing something of value. Risk-compensation relationships have created interesting questions for the psychological researchers. Kogan and Wallach (1969) asserted that decision-makers view costs as being more important than rewards. They also maintained that a trend in risk attitude is evident when the absolute magnitude of both risk and reward changes, and risk aversion increases as the magnitude of the positive and negative incentives becomes larger. They also contended that the rate of increase in risk aversion, as potential losses increase, exceeds the rate of increase in risk taking as potential rewards increase.

The environment might also affect attitudes toward risks. This category involves factors as diverse as physical and cultural environmental characteristics. The physical aspects of nature may influence attitude toward risks in different settings. With cultural environmental characteristics of risk propensity, Touhey (1971) found that Canadians preferred more conservative risks than American people. Another environmental determinant of risk taking could be the individual's social position. Cecil (1972) found that subjects from low-income families were more risky than those from medium-income families, while subjects from high-income families were more risky than medium income subjects. Such social factors as cultural bias and a "risky shift phenomenon" may also influence risk

taking propensity (MacCrimmon and Wehrung 1986). When there exists a cultural bias in favor of taking risks, some people may take more risks than they are inclined to because they believe it is socially expected of them. In "the risky shift", people collectively tend to shift toward an even greater willingness to take risks when they are asked to make a group decision. Risks may be perceived to be lower in the group decision than in the individual decision.

The amount of information given in a risky situation is another possible situational determinant of risk propensity (Newton 1976). The greater the amount of relevant information which one is able to gather and evaluate, the more clearly he can foresee the outcome. Relevant information reduces risk. In fact, if one possessed complete information, there would be no risk involved.

Another factor which influences an individual's risk attitude is experience (Newton 1976). Experience with a particular task provides relevant information about the decision variables and parameters on which the outcome will depend. Experience may provide insights into the manner in which particular combinations of variables react, thus enhancing the decision-maker's predictive power.

Most of the empirical studies examining the construct of risk propensity seemed to be based on the three most

highly regarded theoretical backgrounds: (1) Atkinson's achievement motivation theory, (2) Kogan and Wallach's theory of motivation and cognition, and (3) Kahneman and Tversky's prospect theory.

Atkinson's theory of achievement motivation (1964) is not specifically intended to explain risk-taking behavior; however, a risk-taking construct is incorporated within the conceptual framework. The construct asserts that individuals are aware that their performance in given tasks will be evaluated according to certain success criteria. Supposedly, this evaluation creates a desire to perform, thus the situation becomes achievement-oriented in nature.

Depending on the reactions to these achievement-oriented situations, individuals are placed into one of two possible categories: (1) persons who are high in the need to achieve success and (2) those who are high in the need to avoid failure. The former group seeks out tasks in which there are performance standards against which to compete, while the latter group tries to avoid these situations because they are afraid of failing. The theory states that individuals in whom the motive to succeed is greater than the motive to avoid failure prefer tasks with intermediate probabilities of success. In contrast, persons dominated by the motive to avoid failure prefer tasks in which the probabilities for success are either very high or very low.

Success-motivated individuals prefer intermediate probabilities because this is the area where significant achievements are reasonably possible. In contrast, the individuals who strive to avoid failure prefer greater certainty of knowing that they will either likely succeed or probably fail, depending on their choice of high or low probabilities. But failing to accomplish a low probability task is not really failure, since no one really expected them to achieve such a difficult task. Thus, Atkinson relates risk taking to the need for achievement and risk aversion to the need to avoid failure.

Interestingly, Wilson (1971) applied Atkinson's risk-taking theory to the industrial marketing area. Wilson, based on Atkinson's two personality types, classified personality traits into (1) need for certainty, (2) generalized self-confidence and (3) need to achieve. Wilson then found that an individual's need for certainty may be a good predictor of his decision-making style.

Kogan and Wallach (1964) expanded Atkinson's motivational determinants being distinguished between motivationally and cognitively determined risk taking. They focused on two motivational determinants: test anxiety (Atkinson's fear of failure motive) and defensiveness (a trait which causes one to project and protect a particular image; for example, males might seek to maintain a bold, risk-taking image). Motivation risk

takers are defined as those who have high scorers in test anxiety and defensiveness. Test anxious and defensive subjects are characterized by a "risk conservative syndrome." that is , their behavior is overinfluenced by motivational requirements, such as defending one's self image or avoiding failure, and underinfluenced by situational aspects of a task. In contrast, cognitive risk takers score low in test anxiety and defensiveness. Instead of allowing motivational determinants to dictate the decision, they carefully evaluate situational cues which are relevant to successful performance.

Neither cognitive nor motivational risk takers are necessarily risky or conservative. The difference between them lies in the consistency with which their risk-taking strategy is employed. Motivationally determined risk takers are either consistently risky or consistently conservative. Their concern with anticipated evaluation causes them to ignore whether or not a task requires skill or merely luck. Their defensiveness causes them to ignore the effects which different risk-taking strategies may have on particular tasks. In contrast, cognitive risk takers do not exhibit a consistent risk-taking orientation across various tasks. They examine the particular situation and choose the decision strategy whose expected success is greatest. In this regard, Alker (1969) equated

motivational risk taking to irrational risk taking and referred to cognitive risk taking as rational risk taking.

In their groundbreaking study of people's risk taking behavior, Kahneman and Tversky (1984) found that people were generally content to accept a large probability of winning a small amount of money, rather than go for a slimmer chance of winning a larger amount. In their terms, people generally assess potential gains and losses in risk related transactions, rather than looking at final states of wealth. The pleasure of a gain is generally felt less keenly than the pain of a loss. The pain per dollar of loss is greater for a small loss than a large one, and similarly the pleasure per dollar of gain is greater for a small gain than that of a large one. Quite interestingly, MacCrimmon and Wehrung (1986) tried to measure risk propensity for 509 top-level executives on the basis of the prospect theory of risk taking. The measure was developed on the following principles of Kahneman and Tversky's prospect theory.

1. In choices among two-outcome wagers having equal expected payoffs and the same chance of loss, a risk-averse person will prefer wagers with lower loss amounts;

2. In choices among two outcome wagers having equal expected payoffs and the same loss amount, a risk-averse person will prefer wagers with lower chances of loss;

3. In choices among two-outcome wagers having equal expected payoffs and the same gain amount, a risk averse person prefer wagers with lower expected losses;

4. In choices among two-outcome wagers having equal expected payoffs, a risk averse person will prefer wagers with lower variation in payoffs;

5. A risk averse person will prefer the certainty of getting the expected payoff of a wager to the wager itself.

In essence, these behaviors are contrary to economic utility theory, which states that people should evaluate the risk and the amounts as a single consideration.

The influence of psychological attributes of decision makers on the strategies they adopt in decision making tasks has received considerable attention in the psychological research literature (e.g., Bourne, Ekstrand, and Dominowski 1971; Lanzetta and Kanareff 1962). However, the influence of the decision-maker's risk taking propensity on his decision making strategies has not been systematically investigated. Some of the research in the field of psychology and management suggest that the risk propensity of a decision maker can influence his/her decision making.

Baird and Thomas (1985), in their risk taking model in strategic management decisions, suggested that strategists' risk propensities be considered important influences on corporate strategy. They emphasized that the

emergent pattern of realized strategies perhaps can be understood only by studying the risk taking propensity of the decision makers as they interact with particular decision situations. Baird and Thomas predicted that strategic risk taking is a function of (1) general environmental risk indicators such as economy and cultural values, (2) industry risk indicators such as capital intensity and competition, (3) organizational risk indicators such as structure and market share, (4) problem risk indicators such as framing and variance of outcomes, and (5) decision maker risk indicators such as self-confidence and knowledge.

Taylor and Dunnette (1974) investigated the influence of risk taking propensities on decision making strategies for a sample of industrial managers. They reported that the risk taking propensity was negatively associated with both the time required to reach a decision and the amount of information upon which the decision was based. It was also found that although risk taking decision makers reached rapid decisions by the expedient of restricting their information search, they gave careful attention to the information they acquired. Clearly, a decision maker's risk propensity should figure predominantly in his/her risk handling processes and strategies.

Risk propensity in decision making behavior is unique to the individual decision maker. The relationships

between risk propensity and characteristics of the decision maker, such as age, sex, and education, have also received attention in empirical studies.

A number of studies found that risk propensity decreases with age. Kogan and Wallach (1964) reported that young people tended to be more risk taking than old people. MacCrimmon and Wehrung (1986) also reported that older managers were more averse to risks, while younger managers were more risk taking. Thus, there seems to exist a negative association between risk propensity and age.

The relationship between education and risk propensity has not been clear. Some studies reported no significant associations between risk propensity and education (e.g., Laughhunn et al. 1980). By contrast, MacCrimmon and Wehrung (1986) reported that managers with postgraduate training were greater risk takers than were managers with a bachelor's degree or managers with only a high school degree. Similarly, Haksansson and Wootz (1975), in their experimental study for the sample of industrial purchasers, found that higher education is positively correlated to taking risk. They also reported that a highly educated purchaser is sensitive to differences in the degree of risk in the situation.

Kogan and Wallach (1964) found that young women were more extreme than young men under high confidence conditions in the present judgment situation. Conversely,

young women were less extreme than young men under moderate and low confidence conditions. Women might be more conservative than men when unsure of their decisions and more extreme than men when very sure of their decisions. In sum, no simple generalization can be made about sex differences in risk propensity, but rather the level of certainty of the decisions in question must be analyzed.

A number of studies have characterized the organizational buyer as risk averse. Wison (1971) conducted a questionnaire-based investigation into purchasing decision making through which he determined the prevalence of risk-averse purchasers. He identified two major decision styles in purchasing behavior: normative and conservative. Normative choosers, who accounted for 30 percent of Wilson's sample, tried to maximize the economic expected value of purchases to their companies in a straightforward manner. Conservatives, who accounted for 55 percent of the sample, by contrast, did not make choices consistent with economic expected value but instead avoided uncertainty and the possibility of large negative outcomes; they were risk avoiders. A small third group switched between these strategies.

Summary

Risk propensity has been conceptualized either as a general psychological disposition or as situationally

variant. The psychological attributes of a decision-maker influence his decision making behavior. Likewise, a decision maker's risk propensity can have an impact upon his decision making process. In the context of risk handling, the perception of risk and strategies adopted in the risk handling task can be influenced by a decision maker's attitude toward risks: risk propensity.

Kogan and Wallach (1964) proposed two risk taking styles: motivationally determined risk taking and cognitively determined risk taking. The former type of risk takers respond to the risky situations in a consistent manner. Hence, they are either consistently risk taking or risk averse or risk neutral. By contrast, the cognitive risk takers do not exhibit a consistent risk propensity across various tasks. They examine the particular situation and respond to each of the situation. Cognitive risk takers have been referred to as rational decision makers; motivational risk takers have been referred to as irrational decision makers.

Kahneman and Tversky (1984) proposed a theory of risk taking: prospect theory. Importantly, this prospect theory is contrary to the classical economic utility theory, which states that people should evaluate the risk and the amounts as a single consideration.

Industrial buyers have traditionally been considered as risk avoiders; however, this relationship seems to need further clarification.

Perceived Risk Literature

First of all, there should be some clarification between two essential concepts of risk: perceived risk and risk propensity. Very importantly, Blaylock (1985) highlights this issue. Blaylock proposed that studies of risk in decision making fall into three groups. One group, estimating the level of risk, asks "How much risk is there?"; another, investigating risk attitude, inquires "What is the decision maker's attitude toward risk?"; and the third, exploring risk perception, queries "How much risk does the decision maker perceive?" According to Blaylock, perception of risk comes from traditional risk information, the decision environment, and the decision maker's cognitive style. Most situations contain an objective amount of risk, a quantity which is enhanced or abated in the decision maker's perception through other cues contained in the decision environment. Consequently, the perception of risk should be distinguished from either an objective amount of risk or risk propensity.

There is widespread confusion on the distinction of perceived risk from risk propensity. For example, Dowling (1986), misclassified a scale used by Bonoma and Johnston

(1979) as a measurement of perceived risk. Quite clearly, the Bonoma and Johnston measure was developed based on the Kogan and Wallach's measure of risk propensity. Hence, both measures set out to measure risk propensity, not to measure perceived risk. Another example of confusion can be found in a classical piece. Discussing whether perceived risk might be defined as a generalized personality tendency, Cunningham (1967) also confused the construct of perceived risk with risk taking propensity. Slovic (1964) cogently argued that we must distinguish between individual differences in the perception of risk and differences in reaction to that risk. Further research needs to concentrate on the clear distinction of these two concepts, developing and testing models about the relationship between the two concepts.

The concept of perceived risk was first introduced in the field of consumer behavior by Bauer (1960). The concept is based on the idea that consumer behavior involves risk in the sense that any action of a consumer will produce consequences which he or she cannot anticipate with anything approximating certainty, and some of which at least are likely to be unpleasant (Bauer 1960). Bauer also argued that a consumer is forced to deal with uncertainty and select a course of action to reduce perceived risk. Hence, the view of consumer behavior as risk taking stems

from the concept of perceived risk which exists in the purchase situation.

Since Bauer's introduction, several models of industrial and consumer buying decision have broadly incorporated the perceived risk construct. Howard and Sheth (1969) conceptually dealt with the construct of perceived risk under "stimulus ambiguity." It is logical to hypothesize that the more ambiguous a decision situation is, the more likely a decision maker perceives higher risks. Webster and Wind (1972) suggested that industrial purchasers will attempt to deal with the uncertainty of a purchase decision by reducing perceived risk. Sheth (1973), in his model of industrial buyer behavior, included the construct of perceived risk as one of the components of product-specific factors which affect the industrial buying process. Sheth also suggested that the greater the perceived risk in a specific buying decision, the more likely it is that the purchase will be decided jointly by all parties concerned. Engel, Blackwell, and Miniard (1986) positioned perceived risk in the "external search and alternative evaluation" stage of decision-making. In their terms, perceived risk can lead to greater information search in order to learn more about the choice alternatives.

There exist many studies examining the role of perceived risk either in the consumer buying or industrial

purchasing decision process. Quite comprehensively, Dowling (1986) proposes the 12 statements about the nature of perceived risk and its influences on consumer behavior. Among those statements, two statements synthesize much of the research in the area of consumer behavior. One is that perceived risk stimulates information search and risk handling behavior. As previously indicated, the effect of perceived risk on information search is well embedded in the Engel, Blackwell, and Miniard model. However, some studies raised severe doubts about the general belief that high perceived risk induces intensive information search. For example, Gemunden (1985), in his a systematic meta-analysis of 100 empirical findings, reported that perceived risk usually seemed to remain below the tolerated threshold for convenience goods, while information search turned out to be only one among several risk reduction instruments for complex goods. Thus, it seems that the relationship between perceived risk and the amount of information seeking may be influenced by the type of products, the validity of perceived risk measurement, and by the operationalization of information search. Further research on this relationship should be done to clarify the effect of perceived risk on information seeking behavior.

The other statement is that perceived risk affects choices among products. Given the view of consumer behavior as risk taking (Bauer 1960), the perception of

risks inherent in the buying situations is expected to influence consumers' risk handling behavior which, in turn, affects their buying decision processes. Ross (1974) summarized empirical studies examining effects of perceived risk on overt consumer behaviors such as new product adoption, store/brand loyalty, and modes of shopping. Interestingly enough, Dowling (1986), focusing on the link between perceived risk and risk thresholds, predicted consumer behavior focusing on the link between perceived risk and risk thresholds. If perceived risk exceeds the individual's maximum threshold, extra information may be undertaken as a potential risk reduction strategy. On the other hand, perceived risk below the minimum threshold may stimulate curiosity or variety seeking purchase behavior. When the level of perceived risk is between the two thresholds, normal shopping activity will be undertaken.

Considering the large number of publications on perceived risk in the field of consumer research, there exist relatively few studies applying the concept of perceived risk to industrial buying decision situations. This might result from the classical assumption of such an economically rational choice process of industrial purchasing behavior. Traditionally, consumer buying has been portrayed as irrational, while industrial buying has been portrayed to be rational. Consequently, the full incorporation of perceived risk into the industrial

purchasing context has not been accomplished. However, some researchers have introduced additional view of industrial buying as irrational. For example, Feldman and Cardozo (1969) emphasized noneconomic influences in the industrial decision process, and Sheth (1973) integrated the construct of perceived risk into his model of industrial buying behavior.

It is also encouraging that some research has shown that the theory of perceived risk is applicable to organizational buying decisions. For example, Puto et al. (1985) examined the industrial buyer's vendor selection decision process as one of problem solving in the face of risk. Wilson (1971), in his industrial buyer's decision-making styles, found that an individual's need for certainty appears to be an important influence upon choice under conditions of uncertainty. Wilson also concluded that risk perception did appear to influence choice patterns.

Some research on industrial buying behavior suggests that supplier choice may be influenced by the level of perceived risk in the vendor selection process. Cardozo and Cagley (1971) reported that the industrial purchasers who played the buying game held clear preferences for types of bidders and bids, responded to the amount and type of risk in the purchase situations, and exhibited identifiable behavior patterns which could form bases for segmenting

industrial markets. Quite simply, the dimension of perceived risk may discriminate among three different types of buying decisions: the new task, the modified rebuy, and the straight rebuy (Robinson et al. 1967).

Some researchers have examined the determinants of perceived risk in the industrial buying situation. Cardozo (1968) offered a list of conditions for determining when perceived risk will be high in the industrial buying decision. These conditions suggest that perceived risk is determined by (1) size of purchase, (2) complexity of purchase, (3) percentage of the total value added to the product by the buying company, (4) probability of the buyer's making an unsatisfactory choice, (5) consequences of making an of dollar amount, and (6) influence of the purchase on the market for the particular commodity. Newall (1977), in his model of the risk handling behavior for communication policies in industrial marketing, introduced a basic perceived risk model of industrial buyer behavior. This model is presented in Figure 1. This model seemed to be designed on the basis of the classical S-O-R model by including the determinants of perceived risk (stimulus), perceived risk (organism), and consequences of perceived risk (response). The determinants of perceived risk include (1) characteristics of the purchase problem, (2) characteristics of the industrial buyer, and (3) characteristics of the organizational environment.

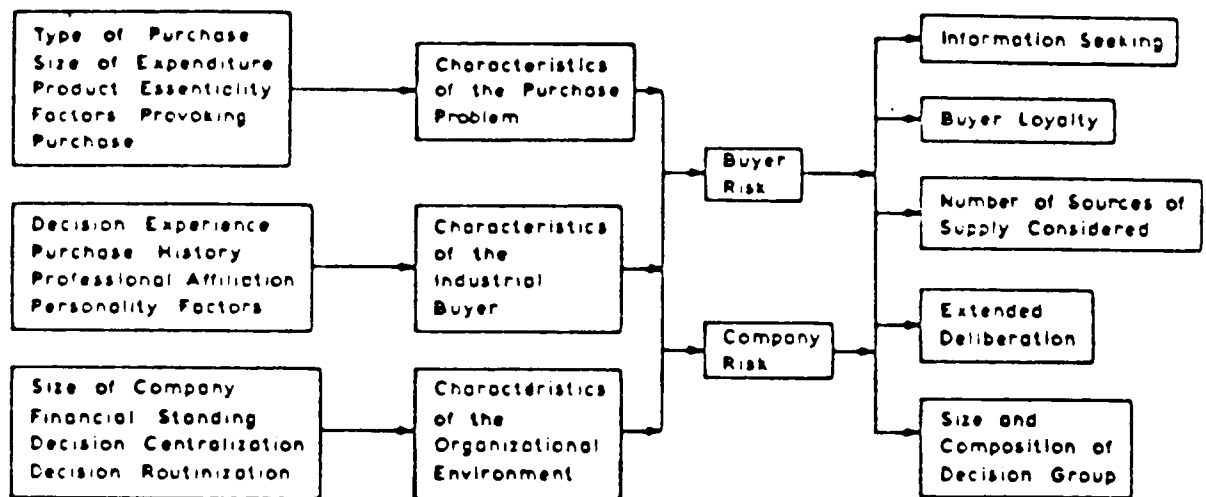


Figure 1: Basic Perceived Risk Model of Industrial Buyer Behavior

Source: John Newall (1977), "Industrial Buyer Behavior: A Model of the Implications of Risk Handling Behavior for Communication Policies in Industrial Marketing," European Journal of Marketing, 11 (3), 169.

Specifically, the first category involves such characteristics as type of purchase, size of product expenditure, product essentiality, and the factors provoking purchase. The second category of personal characteristics include decision experience, purchase history, professional affiliation, and personality factors. The third group of the determinants of perceived risk include size of company, financial standing, decision centralization, and decision routinization.

Similarly, Blaylock (1985) combined three factors to determine risk perception: (1) cognitive style (a decision maker's preferred model of obtaining and evaluating information), (2) decision environment (the setting in which a decision is made), and (3) traditional risk measures (numerical sources used to evaluate uncertainty). Findings from these studies on the determinants of perceived risk suggest various organizational characteristics (e.g., size, profitability, and R&D expenditure), individual decision-maker characteristics (e.g., age, education, and decision-making style), and characteristics of purchase problems (e.g., types of buying situation and size of purchasing) can mediate perceived risk.

In essence, the examination of the construct of perceived risk in the industrial buying decision research proposes that the degree of perceived risk influences the

style of the industrial buying decision-making and determines the risk handling strategies.

Even though little definitional accord has been achieved on the nature of perceived risk, two major conceptualizations of perceived risk have been developed in the field of consumer behavior. First of all, perceived risk has been conceptualized in terms of two components, uncertainty and consequences. Bauer (1960) defined perceived risk as uncertainty about the outcome of a decision and the consequences of alternative decisions. Similarly, Kogan and Wallach (1964) have suggested that the concept of risk may have "--- two, somewhat different facets: a 'chance' aspect where the focus is on probability; and a 'danger' aspect, where the emphasis is on severity of negative consequences." Cox (1967), elaborating Bauer's conceptualization, suggested that the amount of perceived risk is construed to be a function of (1) the amount of loss, and (2) the individual's subjective feeling of certainty that the consequences will be unfavorable. Cox's suggestion implies that the degree of perceived risk may be reduced by either reducing the amount of loss and/or increasing the feeling of subjective certainty that loss would not occur. Cunningham (1967), and Jacoby and Kaplan (1972), also agreed with this two-component conceptualization of perceived risk.

Bettman (1973) introduced the following constructs similar to the two dimensions of perceived risk: inherent risk and handled risk. Inherent risk was defined as the latent risk a product class holds for a consumer, or the innate degree of conflict the product class arouses in the consumer. Handled risk was defined as the amount of conflict a product class engenders when the buyer chooses a brand from that product class in his usual buying situation (Bettman 1972). Thus, handled risk includes the effects of information and risk reduction processes as they have acted on inherent risk. It is also noteworthy that Cardozo (1968) supported a two component paradigm in his study of the applicability of the perceived risk concept to industrial marketing. McMillan (1972), in his research on perceived risk in vendor selection decisions, employed this two-component paradigm and reported the existence of risk perception differences between three groups of decision participants: purchasing agents, scientists, and managers. Consistent with the two-component view of perceived risk, Upah (1980) introduced the type of risk involved in the organization buying decision with respect to uncertainty and magnitude of loss.

In sum, perceived risk can be conceptualized with respect to both dimensions of uncertainty and consequence. By definition, uncertainty refers to lack of information about the likelihood that a course of action will be

followed by undesirable outcomes, while consequence refers to how intensely undesirable these outcomes would be (Choffray and Johnston 1979).

Given this two-factor characteristic of perceived risk, many of the perceived risk researchers attempted to measure perceived risk by asking two sets of questions, one relating to the uncertainty component and the other relating to the consequence component. An initial measurement for perceived risk was proposed by Cunningham (1967), utilizing ordinal certainty and danger scales. Cunningham then arbitrarily combined these scales multiplicatively and developed risk categories. Bettman (1973) attempted to remedy some of the shortcomings of this previous measurement of perceived risk. Pointing out that Cunningham's measure of perceived risk deals only with inherent risk, Bettman (1973) made a distinction in measurement between inherent risk and handled risk by means of the choice situation utilized. The measurement of handled risk involved the effect of brand knowledge and information. However, Bettman's measures of inherent risk and handled risk still included both certainty and danger questions.

McMillan (1972) employed three alternate measurement models for perceived risk. First, he used the uncertainty model of perceived risk. He also employed two models combining uncertainty and importance. One model was the

additive model of perceived risk. In this model, the uncertainty and importance components were added. The other was the multiplicative model of perceived risk where the uncertainty and importance components were multiplied. Thus for both the additive and multiplicative models, the following assumptions were necessary: (1) both the uncertainty and importance components should be equally weighted, and (2) the gradations are spaced equally on both scales with the distance between each gradation the same on each component scale. In these three alternate measures for perceived risk, the uncertainty component has been measured on the scale ranging from "very certain" to "very uncertain" and the consequences similarly measured on the scale ranging from "very important" to "not very important."

Dowling (1986) summarized the majority of measures of perceived risk into the following five categories: (1) an uncertainty only model, (2) the multiplication of uncertainty and adverse consequences model, (3) the multiplication of summed uncertainty and summed adverse consequences model, (4) the summed probability of loss, and (5) the multiplication of summed probability of loss and summed importance of loss model. Dowling also suggested that these models have formal parallels with subjective expected utility models in psychology and the attitude models used extensively in marketing and psychology. In

essence, it seems that the dimensions of uncertainty and consequence (or importance) are the key elements in measurement of perceived risk across these five alternate models. Among these measures of perceived risk, the multiplicative measure has widely been used. Perceived risk researchers seem to rely on the work done with multiattribute attitude models where the multiplication of beliefs (similar to uncertainty) and importance (similar to adverse consequences) has had widespread support. Dowling also introduced theoretical and practical arguments for selecting a multiplicative relationship between the uncertainty and consequences components of risk, namely, that (1) the absence of either variable would eliminate risk, and (2) the influence of a nonsalient adverse consequence on overall perceived risk is reduced.

Bettman (1973) compared a multiplicative model with an additive model of perceived risk, and found little difference between the two models. The two models examined were the simple linear model: $Y = aX_1 + bX_2$, and the multiplicative model: $Y = cX_1^{b1}X_2^{b2}$ where Y represents perceived risk, X_1 uncertainty, and X_2 importance. Bettman, however, reported that the additive model fit slightly better than the multiplicative model. Similarly, McMillan (1972) could find no critical basis to select one model over the other, even though he reported that the additive model was found to be completely inferior to the

multiplicative model in discriminating power. However, preference for the multiplicative model over the additive model may be ascribed to the work done with multiattribute attitude models where the multiplication of beliefs (similar to uncertainty) and their importance (similar to adverse consequences) have widespread support (Dowling 1986).

The other conceptualization that perceived risk is a multidimensional phenomenon has been widely accepted and utilized by many researchers in consumer risk behavior studies. Cox (1967), in the context of consumer buying, proposed that buyer risk consists of performance risk and psychosocial risk. Taylor (1974) conceptualized perceived risk as having two dimensions: psycho/social loss, and functional/economic loss. Roselius (1971) conceptualized perceived risk on four dimensions: time loss, hazard loss, ego loss, and money loss. Jacoby and Kaplan (1972) conceptualized perceived risk on six dimensions: financial, performance, physical, psychological, social, and time risks. Presumably, consumers combine these dimensions in some way to arrive at an overall risk assessment.

The dimension of company risk is unique to the industrial purchasing context. By "risk," consumer risk researchers meant only buyer risk, while industrial risk investigators included both buyer risk and company risk. Newall (1986) distinguished company risk from buyer risk.

To the extent that a company is able to tolerate risk depending on its size and financial standing, and to the extent that purchase routines are available to handle and reduce company risk, the buyer's level of personal risk will vary accordingly. As indicated previously, Cox (1967) proposed that buyer risk consists of performance risk and psychosocial risk. In an industrial context, performance risk describes the buyer's uncertainty perceived in relation to the performance aspects of the materials and equipment. On the other hand, psychosocial risk is likely to define the extent to which the buyer fears being held responsible or accountable for the decision by other members of the buying center. Consistent with Newall's position, Choffray and Johnston (1979), in their study of perceived risk for a new industrial product, subdivided the dimension of consequences between personal consequences for the decision maker and organizational consequences. Choffray and Johnston also distinguished these two main types of potential consequences at all four levels: economic consequences, i.e., cost-effectiveness of the product, and performance consequences, i.e., reliability-dependability of the product.

It is important to note that the components and dimensions of perceived risk in an industrial context could be treated synonymously with vendor selection criteria. The criteria which a buyer employs to evaluate potential

suppliers consist of the possible elements of undesirable consequences. Hence, the buyer may consider every aspect of these vendor selection criteria to reduce the level of perceived risk inherent in the purchasing situation. At the same time, the level of perceived risk is expected to vary with the risk components which are vendor selection criteria. McMillan (1972) investigated the role of perceived risk in vendor selection decisions. He suggested 16 risk content variables, most of which were derived from vendor selection criteria. Among those 16 risk content variables, four variables were related to cost and quality of the product; four variables to salesperson; and eight variables to characteristics of the supplying company.

There exist many studies investigating only vendor selection criteria. Lehmann and O'Shaughnessy (1974) suggested 17 attributes of industrial vendors. Lehmann and O'Shaughnessy found that five factors emerged in the analysis of their 17 supplier attributes. They stated that the first factor appeared to be related to operating characteristics. Other factors were price, ordering convenience, reputation, technical capabilities, and sales service. Evans (1980) replicated, in part, the Lehmann and O'Shaughnessy study examining the relative importance of different attributes across four industrial product types. Evans found similar conclusions. Dempsey (1978) examined 20 vendor attributes. He introduced five factors which

emerged in the analysis of vendor attributes ratings. These factors, from the most important to the least important, were: basic economic criteria, attendant services, geographic affinity, assurance mechanism, and vendor stability. Moriarty (1983), in his study of organizational decision making, evaluated 33 product attributes and aggregated them into 14 macro-attributes. Among 14 product attributes, those ranked highly were service, reliability, compatibility, delivery, speed, absolute price, and aesthetics. Farrell and Aljian (1982) also suggested very similar vendor selection criteria. Among the criteria, those suggested as major categories were management capability, technical capability, manufacturing capability, labor-management relations, past performance, financial strength, and ethics.

Summary

Perceived risk stimulates information search and risk handling behavior, and affects consumer and industrial buying decisions. Perceived risk has been conceptualized in terms of two components: uncertainty and importances. Perceived risk has also been conceptualized as a multidimensional construct. Vendor selection criteria were treated synonymously with risk components in the industrial purchasing context. For measures of perceived risk, the multiplicative measure of perceived risk has widely been

more used. In general, the literature reports no difference between the multiplicative measure of perceived risk the additive measure of perceived risk. Importantly, the construct of perceived risk has been confused with the concept of risk propensity.

Risk Handling Strategy Literature

Perceived risk stimulates risk handling behavior (Dowling 1986). Perceived risk creates some levels of anxiety which, in turn, create tensions that are intolerable or at least unpleasant (Fisher 1970). To reduce anxieties, consumers are thought to develop risk handling strategies. Many studies introduced a variety of risk handling strategies and investigated some issues related to these strategies. Bauer (1960) suggested brand loyalty, prepurchase deliberation, and information searching as major ways of reducing risk to tolerable levels. Cox (1967) summarized the strategies used to reduce perceived risk as follows:

- (1) reliance on past experience and/or on the experience of others;
- (2) information seeking;
- (3) taking precautionary measures;
- (4) choice avoidance;
- (5) goal avoidance; and

(6) delegation of buying responsibility to others who are competent.

Cox also proposed that the choice of these strategies is a function of dominant personality and buying goals, cognitive needs and styles, and degree of buying maturity and experience.

Cunningham (1967), in his study investigating the relationship between perceived risk and brand commitment, reported that consumers resorted to brand loyalty to reduce perceived risk. Sheth and Venkatesan (1968), in their study examining the risk reduction process, reported active information seeking, pre-decision deliberation, and brand loyalty as risk reduction methods for consumer purchases. Roselius (1971) investigated 11 risk reduction methods (brand loyalty, money-back guarantees, free samples, word-of-mouth, etc.). He found that consumers utilized different risk reduction strategies for different types of losses. He also found that brand loyalty and the purchase of a major name brand were the major risk reduction methods. Taylor (1974) introduced three subdivisions of information handling as a way of reducing risks: information acquisition, information transmission, and information processing. In Taylor's terms, consumers evaluate information subjectively and use cues as surrogates for desired information to reduce risks. Taylor also introduced "amount reduction at stake" and "putting

off decisions" as ways of reducing risks. Taylor also stated that self-esteem is instrumental in selecting appropriate risk reduction strategies in that the manner of dealing with uncertainty represents the individual's way of defending his esteem. Likewise, Coopersmith (1967) reported that the amount of risk perceived in a choice situation and types of risk reduction strategies used do vary, depending upon self-esteem (or self-confidence).

Along with risk reduction strategies, Berlyne (1965) suggested that some consumers may use risk enhancement strategies, especially in monotonous environments wherein people engage in diverse exploration. Deering and Jacoby (1972) studied the conditions under which risk enhancement activity might occur. As Venkatesan (1973) pointed out, risk enhancement may be due to the consumer characteristic of "novelty seeking" or "complexity seeking". Such cognitively inconsistent characteristics of consumers may lead to risk enhancement behavior to meet their perceptual and epistemic curiosity. Given the existence of risk enhancing strategies, risk taking or handling strategies cannot be used synonymously with risk reducing strategies, especially in consumer risk research.

Many studies have focused on categorizing the risk handling strategies used by industrial buyers to reduce their risk. Cardozo (1968) reported some findings on industrial buyers risk reduction strategies. When dollar

expenditures for a given purchase were high, a major element of risk was "paying a premium price," and there was doubt about the supplier's ability to meet specifications. Simultaneous scanning of purchasing alternatives was likely to be invoked; that is, several possible vendors were evaluated at the same time. On the other hand, when expenditures were low, risk of failure to meet purchase specifications was low, and the major risk was interruption of supply, sequential scanning of each alternative was more likely. That is, one vendor at a time would be evaluated, with the buyer stopping at the first acceptable supplier. Cardozo and Cagley (1971) showed that buyers consistently favor suppliers with whom they are familiar, which implies that source loyalty is an important factor for risk reduction. Webster and Wind (1972) developed the following more pragmatic classification of risk reduction: information acquisition and processing, goal reduction, source loyalty, and investment reduction. Sheth (1973) summarized these strategies as follows: (1) reliance on supplier reputation, (2) development of strong source loyalty, (3) search for information, (4) reliance on credible sources such as personal friends and experts, and (5) greater deliberation, thinking, and planning in high-risk situations.

Sweeney et al. (1973) administered a questionnaire to 130 members of the National Association of Purchasing

Management, asking them to evaluate two suppliers for electronic components. They identified four distinct risk reduction patterns used by purchasers. The first, external uncertainty reduction, included strategies in which the buyer wanted to visit the cheaper supplier's plant or get a top-management commitment from the supplier about delivery. The second, internal uncertainty reduction, included looking for published information about the supplier, calling other buyers, and so on. The third strategy, external consequence reduction, involved negotiating with the supplier on price or splitting the order between suppliers. The fourth, internal consequence reduction, involved strategies in which the buyer consulted with his or her own management before making a decision. In other words, buyers differed as to where they gathered information (internal versus external) and the type of risk they attempted to lower. Some tried to lower uncertainty (the probability of failure) while others tried to lessen consequences (the outcome of failure).

Newall (1977) has chosen five consequences of perceived risk on which to describe industrial buyer behavior: information seeking, buyer loyalty, number of sources of supply considered, extended deliberation, and size and composition of decision group. Newall added that the precise nature of their employment is likely to depend on the type and level of risk. Puto et al. (1985) suggest

that the risk perceived by the industrial buyer may be decreased by one or more of the following risk handling strategies: (1) reduce uncertainty such as gathering additional information, (2) play the odds such as choosing the vendor with the most favorable expected value, and (3) spread the risk such as multiple sourcing or split procurements. In their terms, loyalty to existing suppliers, the characteristics of the buying situation, and the buyer's perception of the procurement problem are potential mediators of risk handling strategies in the industrial buying decision process.

Copley and Callom (1971) tested Berlyne's formulation in an industrial buying situation. Their study was concerned with industrial search behavior and attempted to relate perceived risk in the stimulus-ambiguity sense. The results from their study appeared to support the hypothesis that a small amount of stimulus ambiguity increases the search behavior of the industrial buyer due to the curiosity motivation to relieve the monotony of continually using the same source of supply. It is intuitively not surprising that only eight percent of the purchasing managers in the Copley and Callom study selected risk enhancing strategies. Rational and objective characteristics are more prevalent in the industrial firms.

Summary

The literature review identified four distinct risk reduction patterns: (1) external uncertainty reduction such as seeking top-management commitment from the supplier about delivery, (2) internal uncertainty reduction such as additional information seeking, (3) external consequence reduction such as negotiating with the supplier on price, and (4) internal consequence reduction such as premeditation before making decisions. Findings from those studies dealing with risk handling strategies suggest that industrial buyers do engage in external information search as a primary risk reduction strategy. Yet it is interesting to note that unless either real or perceived risk compels industrial buyers to do otherwise, they tend to develop simplifying strategies (e.g., source loyalty, selection of relatively nearby vendors, and reliance on past experiences) to decrease the effort associated with a procurement decision. Thus, it would appear that loyalty to the familiar suppliers still remains as a primary risk reduction strategy.

Literature on Supplier Related Factors

Mediating the Risk Handling Process

This section deals with literature review on the following factors which are related to suppliers and affect the buyer's risk handling process: source loyalty,

buyer-seller similarity, perception of the supplier, source credibility, and involvement.

Source Loyalty

The concept of source loyalty has been defined as a preference, inferred from a buyer's observed behavior, to purchase a product or service from the same source from which it was obtained previously (Cunningham and Kettlewood 1976). Quite simply, source loyalty is the act where an industrial consumer remains loyal to a previously selected source of supply. As Cunningham and Kettlewood (1976) pointed out, the value of studying source loyalty lies in its importance to the marketing strategies of suppliers. In case of an established supplier, knowledge of the factors which strength source loyalty enables the supplier to stress them in its strategy. In the case of a new supplier, a thorough understanding of source loyalty enables the supplier to overcome buyers resistance to the placement of an order with a new supplier.

Bauer (1960) was the first to view a policy of remaining loyal as a possible way in which buyers handle decision risk. The concept was first developed in the consumer marketing area in relation to brand loyalty. Since Levitt (1965) extended this phenomenon into an industrial buying context, many researchers examined the role of source loyalty in industrial buying. Wind (1970),

in his industrial source loyalty study, found substantial evidence of the existence of source loyalty in the purchase of industrial components by an advanced electronic firm. Cunningham and Kettlewood (1976), in their study of source loyalty in the freight transport market, found that the same principal source and mode of transport have remained unchanged on average for 11 years. Farmer (1981) noted the case where the industrial buyer is a risk avoider and can be observed with the tendency to retain established suppliers even when competitive alternatives are available. Farmer's study implies the degree of source loyalty can be one of the important mediators influencing risk handling strategies. Puto et al. (1985), in their recent study on industrial vendor selection, also reported the tendency among industrial buyers to remain loyal to existing suppliers. They also suggested if source loyalty is a valid mediator for risk handling, then it should result in an increased tendency on the part of industrial buyers to choose current suppliers when the current suppliers are positioned as the alternative with the higher degree of inherent risk. In sum, to the extent that source loyalty represents a decision simplifying mechanism, the tactic of remaining loyal may be a visible manifestation of risk reducing strategies.

There exist some precedents within the literature to suggest that source loyalty may be related in some way to

the level of perceived risk. Sweeney et al. (1973) ascribed loyalty to existing suppliers to the fact that a current source represents a known entity and thereby reduces (or enables the buyer to handle) a portion of the perceived risk associated with the buying decision. Newall (1977) found that there was not a significant level of association between buyer risk and source loyalty. However, using the company risk variable, he reported that buyers tended to be significantly less loyal at high levels of company risk and vice versa. This could result from the fact that buyers might reconsider many of the available sources of supply when they were faced with high levels of company risk.

The measurement of the degree of source loyalty has not been fully established in the industrial arena. Cunningham and Kettlewood (1976) evaluated the degree of source loyalty of freight transportation industry by examining flows of traffic which had been passing for different lengths of time and analyzing the proportion which had been involved in a change of mode or source. Puto et al. (1985), in their experimental study, measured the degree of source loyalty by having subjects choose between a current supplier who offered the guaranteed contract and a new supplier who offered the risky contract. Wind (1970) utilized four different measures as an index of source loyalty. Among such measures, the number of

purchases from the favorite source as a percentage of total number of purchases from all sources showed the most explanatory power as a measure of source loyalty. The number of purchases from the two favorite sources as a percentage of the total number of purchases from all sources and the number of source shifts as a percentage of the total number of purchases showed a slightly lower explanatory power, but led to similar conclusions. Moriarty (1983), in his industrial buying process study, operationally defined vendor loyalty as the degree of importance associated with purchasing data terminals from existing vendors and from one's present mainframe manufacturer. In his study, vendor loyalty was measured on a scale ranging from 1 "Not Important" to 6 "Very Important."

Buyer-seller Similarity

Past research has shown some correlates of buyer-seller similarity, especially in the study of salespersons. Most of the studies test a very simple hypothesis: Salespeople are more likely to be successful when they are dealing with prospects who are similar to themselves in demographic characteristics, personality traits, and attitudes than when their prospects have characteristics different from their own. Evans (1963), in his survey of life insurance salesperson and their

customers, investigated attitudes, demographics, personality, and other background characteristics of salespersons in terms of buyer-seller similarity. Evans also suggested that the more similar the parties in a seller-buyer dyad, the more likely a sale will occur. Similarly, age (Gadel 1964), behavior and experiences (Brock 1965), and expectations (Tosi 1966) correlates of buyer-seller similarity were investigated. In essence, the concept of buyer-seller similarity was extended beyond attitudes and demographic correlates to personality and expectations. Comparably, it is expected that those involved in the purchasing decision will prefer more similar suppliers over less similar suppliers and such preference will, in turn, influence risk handling behavior of the purchasing professionals. The rationale for this is that the purchasing professionals tend to understand, have empathy for, and be attracted to the supplier more when the supplier more similar to the purchasing professionals.

Source Credibility

Source credibility, another concept associated with source loyalty, has often been examined. Levitt (1965), in his experiment testing the influence of source credibility on the behavior of buyers considering a new industrial product, found that the better a company's reputation, the better are its chances of getting (1) a favorable first

hearing for a new product among customer prospects, and (2) early adoption of that product. He also proposed that the buyer perceives a well-known company as having much more credibility than an unknown one and therefore perceives lower risk in a decision to buy from that company. He concluded that a vendor's reputation influences buyers, decision makers, and the decision making process. This pioneering experiment demonstrated that the familiarity of the buyer with the vendor has a major impact on the buying process. Similarly, Cardozo and Cagley (1971) reported that industrial buyers consistently favor suppliers with whom they are familiar. Ginter (1974), in his attitude change study, showed it is much more likely that a message will be accepted and responded to more favorably when credibility is high. This study appears to confirm the source credibility effect in industrial purchasing situations. Thus, the purchasing decision maker is expected to prefer a more credible supplying source over a less credible source and further that such a preference will affect the purchasing decision maker's risk handling behavior.

As previous research indicates, the dimension of source credibility may involve such components as perceived credibility, perceived familiarity, and perceived trustworthiness of buyer toward the supplier. Expertise and objectivity have been suggested as the two primary

components of source credibility in the consumer behavior literature (Engel, Blackwell, Miniard 1986).

Perception of the Supplier

Recent findings in behavioral decision research suggest that the way in which a decision maker perceives or frames a decision problem can influence the resulting decision. Tversky and Kahneman (1981) suggested that a decision process may be affected by a "decision frame" which is defined as the decision maker's conception of the acts, outcomes, and contingencies associated with a particular choice. As Puto et al. (1985) suggested, decision frames are of potential importance to marketing and sales managers because different perceptions of the decision problem may produce differing decisions.

Though very little is known about the effect of an industrial buyer's decision frame on the industrial purchasing process, the potential application of this effect can be examined. If similar results are demonstrated for industrial buyers, it is expected that the way the industrial purchasing decision makers perceive the supplier can influence their decision process. In the context of risk handling, a buyer's perception of the supplier is expected to influence both the employment of a mix of risk handling strategies and the degree of perceived risk. Intuitively, a positive perception of the supplier

might lead to a lower level of perceived risk in the industrial buying situation. By the same token, the buyer's perceptual differences of the supplier might influence the differing employment risk handling strategies selected.

Some studies have investigated the dimension of perception in the field of industrial marketing. Bonoma and Shapiro (1983) suggested two perceptual variables in their industrial marketing segmentation study: how the buyers perceive the selling company, and how the buyers perceive the vendors.

In essence, the buyer's perception of the supplier is expected to influence the buyer's risk handling process, which in turn affects the industrial buying decision process. The understanding of this relationship may then be beneficial for marketing and sales personnel to seek to influence industrial buying decisions through influencing the buyer's perception of the suppliers.

Involvement

The degree of involvement in the purchasing decision making process is also expected to affect the risk handling process for industrial buying professionals.

In the context of consumer buying, the degree of involvement has been generally considered and discussed in personal relevance or importance (Petty and Cacioppo 1979).

Based on the concept of involvement, Howard and Sheth (1969) originally developed a categorization of decision processes in consumer behavior research: extensive problem solving, limited problem solving, and routinized problem solving. Similarly, in the context of industrial buying, Robinson et al. (1967) proposed a "buyclass" theory of industrial purchases which includes three types of buying situations: new task, modified rebuy, straight rebuy. Interestingly, Moller (1985) integrated an organizational commitment dimension with these two classifications. Anderson et al. (1987) examined the "buyclass" theory on the dimensions of information needs, consideration of alternatives, and newness of the task, and supported the buyclass framework.

Quite importantly, the dimension of organizational involvement is unique to the industrial purchasing. The logic of the distinction between personal involvement and company involvement is arising from two different ways in which an industrial buyer can attach importance to the purchasing decision. Personal involvement denotes the perceived importance attached by the individual to the purchasing decision. On the other hand, company involvement reflects the perceived importance to the company attached by the individual to the same purchasing decision.

It is interesting to note that involvement is closely related to the concept of motivation which plays an important role in the industrial buying situation. Consequently, the perceived degree of motivation in a particular decision situation could be an important mediator which influences both purchasing decision making as well as the risk handling behavior of decision makers. Most visible motivational components such as price benefits, quality benefits, and service benefits from the supplier have been viewed as the primary motives in the industrial buying situations (Crow et al. 1980; Hill et al. 1975). Webster (1968) presented evidence that industrial buying is a joint function of the personal needs of purchasers for recognition and advancement and their social needs to satisfy those in the firm who will be the users of the purchased goods. Moriarty (1983) summarized motivational factors into financial, product service, social, political, and personal benefits.

Summary.

In essence, the variables of source loyalty to existing suppliers, buyer-seller similarity, degree of involvement, perceived source credibility, and perception of the supplier are expected to influence the risk handling process of the industrial purchasing professionals. Specifically, these variables have an impact on perceived

risk and the strategies which the industrial purchasing professionals adopt.

The Risk Handling Process Literature

Taylor (1974) attempted to construct a comprehensive theory of risk taking in consumer behavior by specifying the principal concepts involved and the interrelationships between the concepts. This model of risk taking in consumer behavior includes four principal concepts: choice, anxiety, self-esteem, and uncertainty/risk. The interrelationships of these components of risk taking are briefly described in the following. Both anxiety and consumer's self-esteem influence development of risk-reducing strategies. Any choice situation always involves two aspects of risk: uncertainty about the outcome and uncertainty about the consequences. Uncertainty about the outcome can be reduced by acquiring and handling information. Uncertainty about the consequences can be dealt with by reducing the consequences through reducing the amount at stake or putting off the choice. In a choice situation, risk can be interpreted in terms of possible loss. The loss can be in psycho/social terms or in functional/economic terms, or in some combination of both forms of loss. Figure 2 presents a risk taking model of consumer behavior.

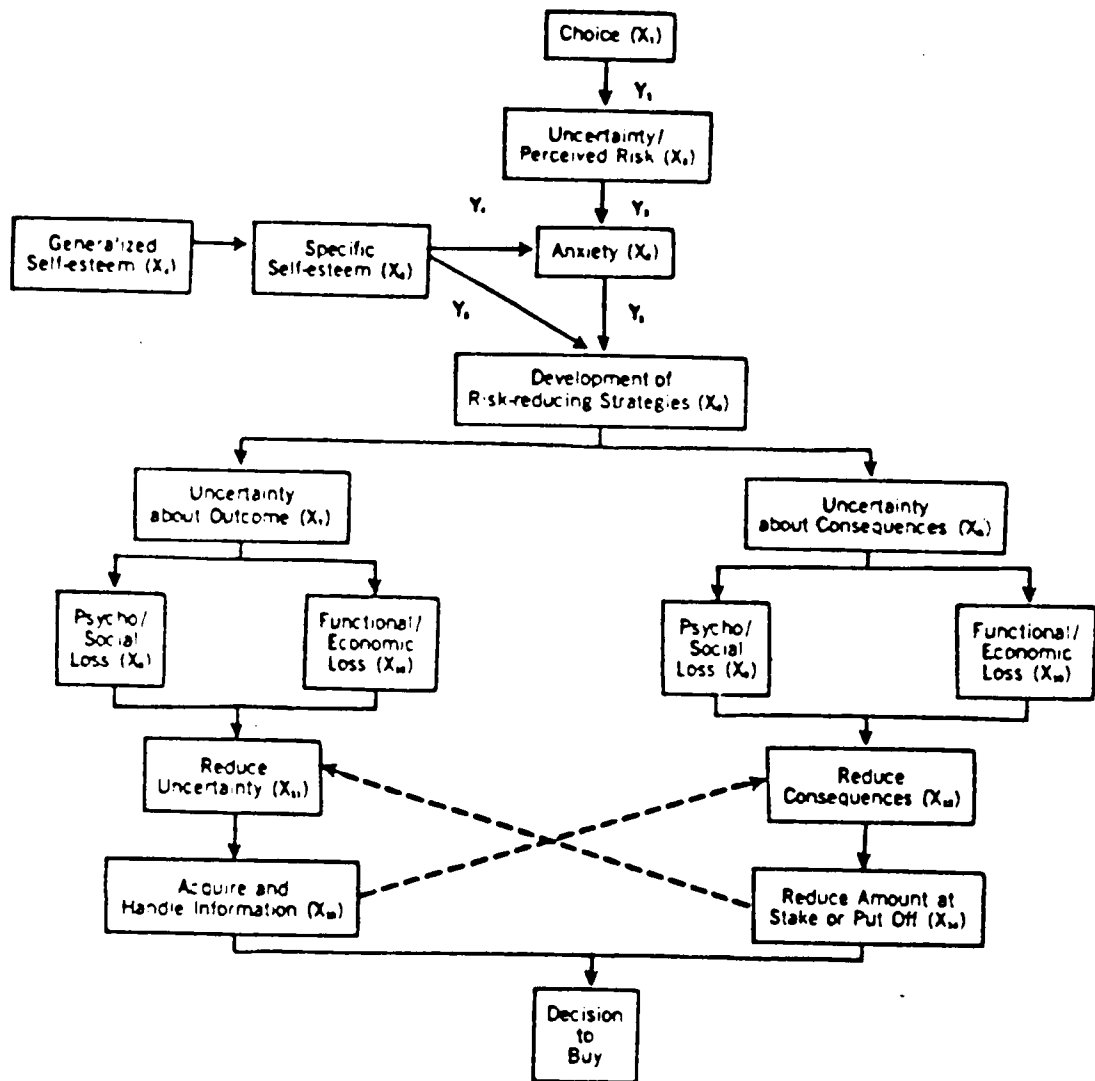


Figure 2: Risk Taking in Consumer Behavior

Source: James W. Taylor (1974), "The Role of Risk in Consumer Behavior," Journal of Marketing, 38 (April), 55.

Baird and Thomas (1985) proposed major steps necessary in dealing with risk in developing strategy. Three main aspects of risk handling are presented: risk identification, risk estimation, and risk evaluation. Risk identification concerns the definition of a risk situation. Here, attention is directed towards defining the problem and assessing the influence of the human element in the decision-making process. Risk estimation involves reducing measurement uncertainty and addresses the difficulties in estimating relevant values, facts, and uncertain events. Risk evaluation concerns those strategic actions leading to either risk acceptance or rejection and to assessing the quality of those actions. Conceptually, these processes overlap and together provide a basis for risk assessment. Figure 3 presents these major steps of strategic risk taking and common concerns in handling strategic risk.

MacCrimmon and Wehrung (1986) presented a model of managing risks. This model consists of five phases of risk taking: recognizing a risky situation, evaluating the risky situation, adjusting the risks, choosing among the risky alternatives, and tracking outcomes. The model involves three risk determinants: lack of time, lack of information, and lack of control. The model also includes three risk components: the amount of loss, the chance of loss, and the exposure to a risky situation. Figure 4 presents a model of managing risks.

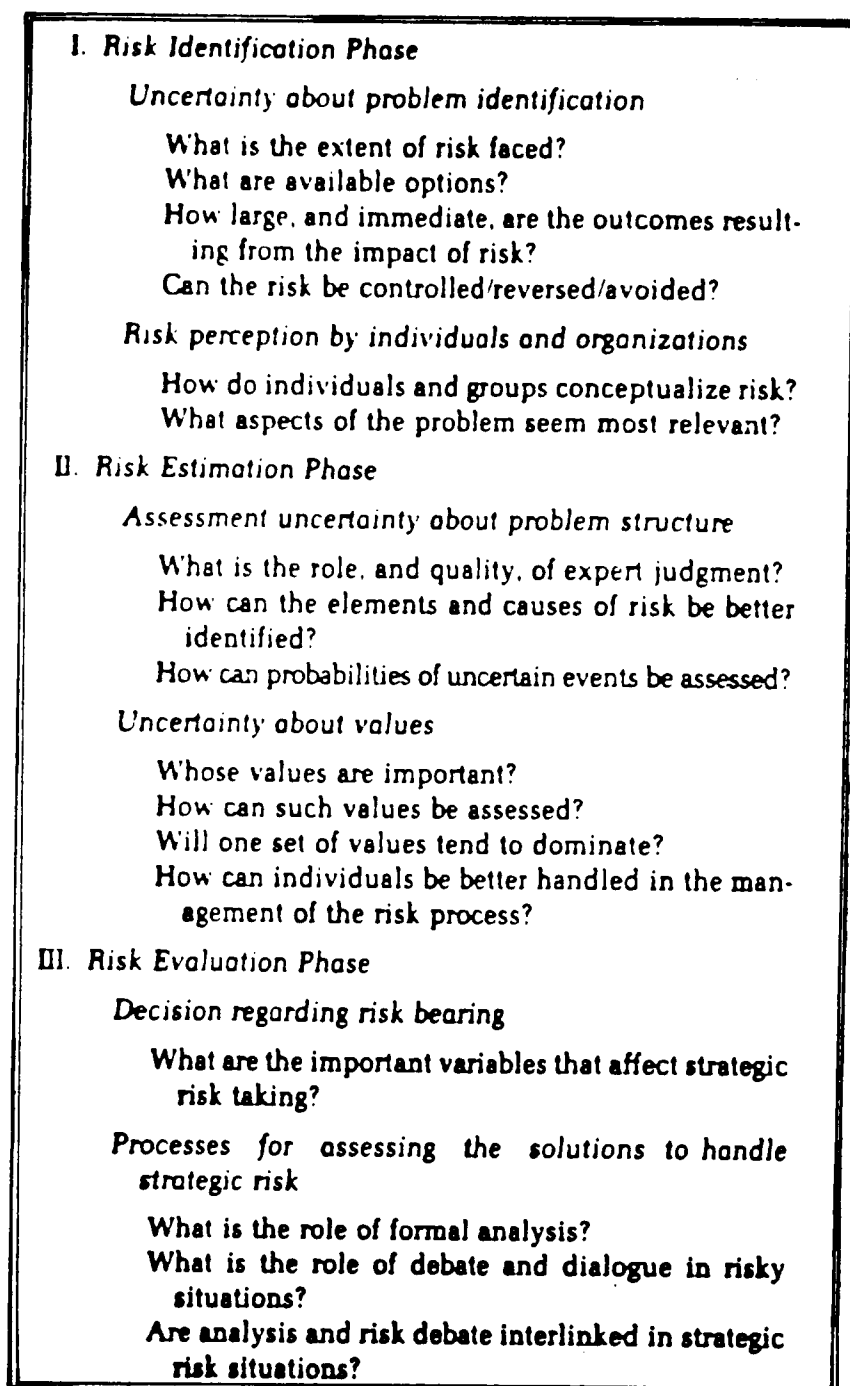


Figure 3: Strategic Risk Handling Phases

Source: Inga S. Baird and H. Thomas (1985), "Toward a Contingency Model of Strategic Risk Taking," Academy of Management Review, 10 (2), 234.

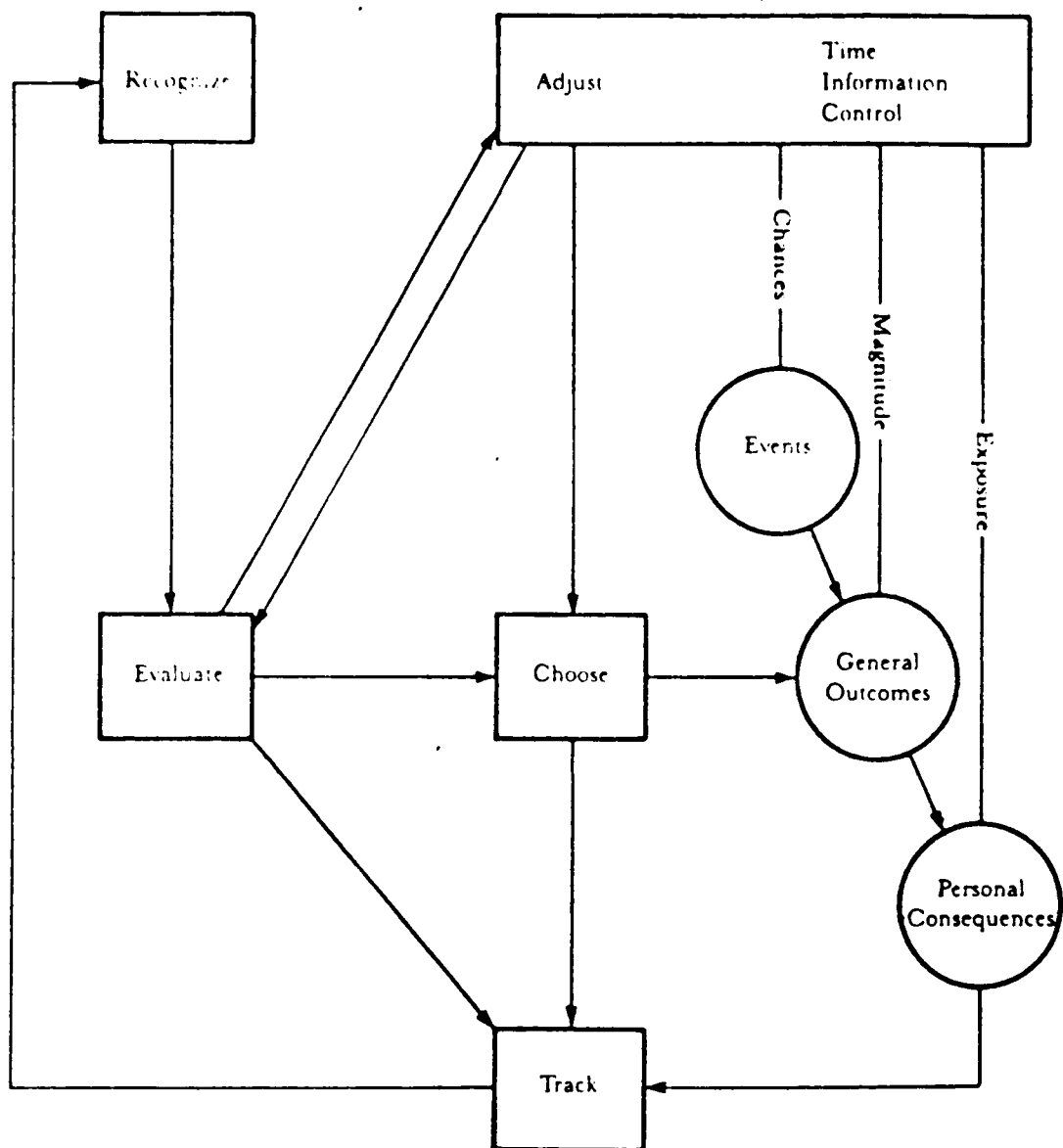


Figure 4: REACT Model of Managing Risks

Source: Kenneth R. MacCrimmon and Donald A. Wehrung (1986), Taking Risks. New York: Free Press, 17.

Three models of risk handling were proposed. The comparisons can be made between these three models of risk handling. There exists a distinct difference in units of analysis. The first model proposed by Taylor (1974) deals with a theory of risk taking in consumer behavior. The other two models proposed by Baird and Thomas (1985) and MacCrimmon and Wehrung (1986) deal with strategic risk management. The unit of analysis for Taylor's model is individual consumers; the other two models are oriented toward managers' risk handling.

Interestingly enough, the origin of both Baird and Thomas, and MacCrimmon and Wehrung models of risk handling may be found in some psychological research which viewed consumers' decision makings as problem solving. In a classic work, Dewey (1910) originally defined five stages of problem solving which, adapted to the consumer behavior context, are problem recognition, search for a satisfactory solution, evaluation of alternative solutions, purchase decision, and postpurchase evaluation. Likewise, McGuire (1976) provided a comprehensive and general framework of problem solving activity. He examined such aspects as exposure, perception, comprehension, agreement, retention, information search and retrieval, decision making, and action. On the whole, most of the modern consumer decision making models (e.g., Howard and Sheth 1969; Bettman 1979; Engel, Blackwell, and Miniard 1986; Peter and Olson 1987)

have been designed and proposed on the basis of such a problem solving paradigm.

In terms of specificity, the model proposed by MacCrimmon and Wehrung deals with more detailed phases of risk handling than the Baird and Thomas model. The former model proposes five phases of risk handling, while the latter one proposes three steps of risk handling. The former model appears to be a more comprehensive model of risk handling.

Summary

The study of extant models of risk handling suggests two implications for this study. This study examines risk propensity and the risk handling process for industrial purchasing professionals. In light of the unit of analysis for this study, Taylor's model of risk taking may not be relevant to the use of this research. Consequently, a proposed conceptual model for the study was designed on the basis of the both models of managerial risk handling. The phases in the proposed model are quite consistent with the paradigm of the problem solving task.

A Proposed Model: Risk Propensity and the Risk Handling Process for Industrial Purchasing

Figure 5 presents a model of risk propensity and the risk handling process for industrial purchasing. This

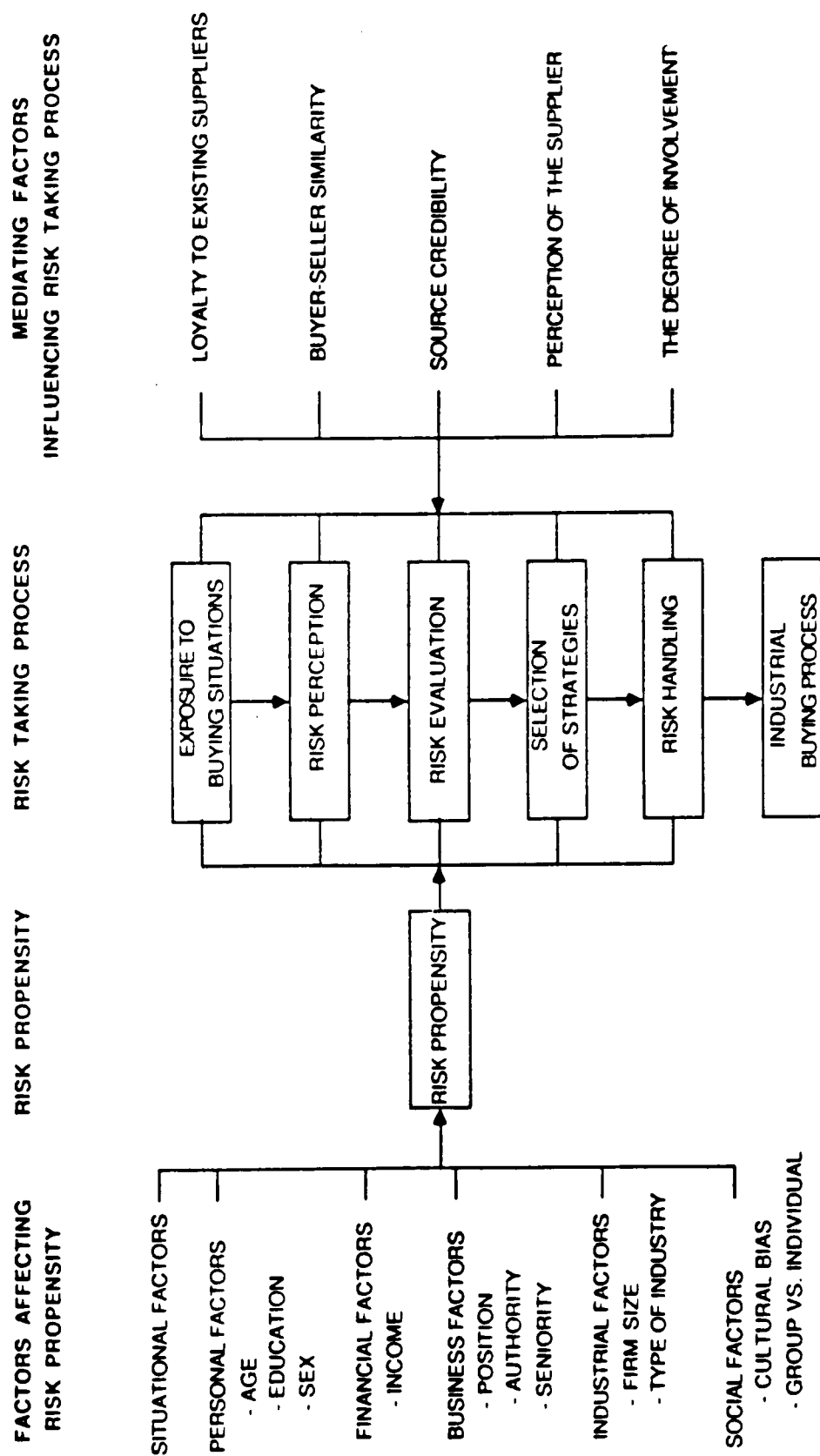


Figure 5: A Proposed Model: Risk Propensity and the Risk Handling Process for Industrial Purchasing

structural model is proposed to serve as a research framework for this study. The concepts and the interrelationships between these concepts in this model were organized from a comprehensive review of the literature. This model synthesizes and expands the current state of the art in the industrial risk-related literature.

The model has four basic components: risk propensity, factors influencing risk propensity, risk handling process, and supplier related factors mediating the risk handling process. The model predicts that risk propensity is situationally contingent. The measure of risk propensity reflects situational characteristics of risk propensity. Risk propensity is also affected by personal (sex, education, and age), financial (income), and business backgrounds (position, authority, and seniority) of industrial purchasing professionals. Risk propensity may vary with the size of the firm and the type of industry. Risk propensity must be also evaluated under the social context.

The risk propensity of industrial purchasing professionals is expected to have a major impact upon the risk handling process. The process of risk handling consists of five phases: exposure to buying situations, risk perception, risk evaluation, selection of risk handling strategies, and risk handling. As with most of the cognitive based decision models, all the steps in this

risk handling process proceed in a very short period of time and interact with each other in a very complex way. Importantly, the process does not occur in a rigid step-by-step sequence. This process of risk taking is very complex and actually can be considered as a "state" as well as a "process". The latter view considers risk taking as a cognitive process. The former view focuses on the specific strategies which have been selected to cope with risks. For this particular study, the latter view is the focus.

The process is roughly divided into two parts. One part includes the first three steps of risk handling: exposure to buying situations, risk perception, and risk evaluation. The other part includes the steps of selection of strategies and risk handling.

Handling risk begins with an exposure to risky situations followed by risk perception. Every purchasing decision entails risk. Even doing nothing about a decision may be risky. Some purchasing situations may bring about more risk than others and vice versa. Consequently, different purchasing situations lead to different levels of perceived risk. After being exposed to a risky situation and perceiving it, a decision maker makes a preliminary evaluation of the acceptability of the risk, which determines the selection of some specific risk handling strategies. Some new strategies may be developed to cope with new risky situations or some favorite strategies may

be sustained to cope with similar risky situations the decision maker developed and utilized before. The decision maker will select some of the strategies from the available groups of strategies he developed. He can then handle the risky situation as a result of his selecting some specific strategies. Finally, the process of risk handling affects industrial buying behavior.

Along with the risk propensity of industrial purchasing professionals, some factors can mediate the whole process of risk handling. These factors are closely related to the supplier. Included in the mediating factors are source loyalty, buyer-seller similarity, source credibility, perception of the supplier, and degree of involvement in the purchasing decision making. The distinction between risk propensity and mediating factors can be easily made in terms of the direction of influence. Risk propensity is solely a buyer's variable, while mediating factors involve both buyer and seller. Hence, these mediators may be referred to as supplier related factors. In essence, the risk handling process of industrial purchasing professionals is influenced by not only their own risk propensity but also by some interactional variables between buyer and seller.

The variables proposed in the model may not be completely exhaustive for any study regarding risk propensity and risk handling behavior. The choice of the

research variables for this study is justified by their important role in the extant risk related research as earlier reviewed and reported.

CHAPTER III

HYPOTHESES AND RESEARCH METHODOLOGY

Introduction

This chapter presents the research hypotheses and related research questions, and methodological procedures to test these proposed hypotheses. The research questions and hypotheses are presented to examine the relationships between the four major parts in the proposed model for risk propensity and the risk handling process of industrial purchasing professionals. These four major parts include (1) factors affecting risk propensity, (2) risk propensity, (3) the risk handling process, and (4) factors mediating the risk handling process. The specific variables contained within each part are presented in Table 1.

Factors influencing risk propensity. Those included in the factors influencing risk propensity are personal factors (age, education, and gender), a financial factor (income), business factors (job position, authority, and seniority), and the industrial factor (firm size). In this study, social factors are excluded from the factors influencing risk propensity because the effects on risk propensity of both cultural biases and group decision making appeared beyond the scope of this research.

Table 1: Research Constructs and Specific Variables within the Constructs

Research Construct	Variables within the Construct
<u>Factors Affecting Risk Propensity</u>	
Personal Factors	Age Sex Education
Financial Factor	Income
Business Factors	Job Position Authority Years Purchasing Experience Years in the Present Position
Industrial Factor	Firm size
<u>Risk Propensity</u>	Risk Propensity
<u>Risk Handling Process</u>	Perceived Risk Risk Handling Strategies
<u>Factors Mediating the Risk Handling Process</u>	
Source Loyalty	Source Loyalty
Source Credibility	Perceived Trustworthiness Perceived Expertise Perceived Professionalism Perceived Familiarity Perceived Credibility
Perception of the Supplier	Perceived Image
Involvement	Personal Involvement Company Involvement

Risk propensity. Risk propensity is a major part of the proposed model. As Blaylock (1985) suggested, a decision maker's attitude toward risk should be differentiated from the perception of risk. In the context of industrial buying, buyer's risk should be treated differently from organizational risk. Hence, the buyer's risk (risk propensity) is expected to have a relationship to the organizational risk (perceived risk).

The risk handling process. Among the components of the risk handling process, the steps of (1) risk perception and (2) selection and employment of risk handling strategies were taken into consideration as research variables. These two steps were selected for two reasons. First, they are considered to be most relevant to the domain of this research. As indicated in the literature review, perceived risk influences the style of the industrial decision-making and determines the risk handling strategies. Second, they are the most measurable among the stages of risk handling. The measures of perceived risk have been widely examined (Dowling 1986) and risk handling strategies have been extensively formalized (Sweeney et al. 1973). Those steps excluded from the consideration in the risk handling process were exposure to buying situations, risk evaluation, and risk handling.

Factors mediating the risk handling process.

Included in the factors mediating the risk handling process

are source loyalty, source credibility, perception of the supplier, and involvement. Buyer-seller similarity was excluded from the consideration as a research variable because the accurate measurement of this variable should entail the investigation of both buyers and sellers. Since this research is limited to the investigation of buyer, the study of buyer-seller similarity seemed beyond the scope of this research. To capture the construct of source credibility, five related dimensions were used. Among these dimensions, perceived trustworthiness, perceived familiarity, and perceived credibility were employed in the study of the source credibility effect in the industrial purchasing (Levitt 1965; Cardozo and Cagley 1971). Perceived expertise was suggested as a component of source credibility in the consumer behavior literature (Engel, Blackwell, and Miniard 1986). Perceived professionalism was added based on experts' opinions expressed during the pretesting of the questionnaire.

The remainder of this chapter is divided into four sections. The first section presents a statement of hypotheses and related research questions derived from the proposed model. The second section deals with research methodology including the research method, focus of the study, sample, and data gathering method. Nonresponse bias was also checked and included. In the third section, measures for the research variables are discussed and then

operationally defined. The final section describes the procedure for the development of the mail questionnaire. The issues of reliability and validity of the measures are also discussed.

Hypotheses

For grouping purposes, the research questions and related hypotheses are divided into three sets. Table 2 summarizes the research hypotheses.

Set I: Correlates of Risk Propensity

The proposed research model predicts that the risk propensity of industrial purchasing professionals is affected by their personal, financial, and business backgrounds. Risk propensity is also expected to be influenced by industry characteristics. The primary objective of hypotheses in set I is to examine personal, financial, business, and industrial correlates of risk propensity for industrial purchasing professionals. The relationships between risk propensity and age (Hypothesis 1), sex (Hypothesis 2), education (Hypothesis 3), income (Hypothesis 4), authority (Hypothesis 5), seniority (Hypothesis 6), job title (Hypothesis 7), and firm size (Hypothesis 8) were explored. The directionality of these hypotheses was based on the research reported in the previous chapter. In addition to the relationships between

Table 2: Summary of Research Hypotheses

Hypothesis #	Hypotheses Contents
1	Age Correlate of Risk Propensity
2	Sex Correlate of Risk Propensity
3	Education Correlate of Risk Propensity
4	Income Correlate of Risk Propensity
5	Authority Correlate of Risk Propensity
6	Seniority Correlate of Risk Propensity
7	Job Title Correlate of Risk Propensity
8	Firm Size Correlate of Risk Propensity
9	Effects of a Pool of Age, Sex, Education, Income, Authority, Years Purchasing Experience, Years in Position, and Firm Size on Risk Propensity
10	Effect of Risk Propensity on Perceived Risk
11	Relationship between Risk Propensity and Risk Handling Strategies
12	Effect of Source Loyalty on Perceived Risk
13-a	Effect of Perceived Trustworthiness on Perceived Risk
13-b	Effect of Perceived Credibility on Perceived Risk
13-c	Effect of Perceived Professionalism on Perceived Risk
13-d	Effect of Perceived Familiarity on Perceived Risk
13-e	Effect of Perceived Expertise on Perceived Risk
14	Effect of Perceived Image on Perceived Risk
15-a	Effect of Personal Involvement on Perceived Risk
15-b	Effect of Company Involvement on Perceived Risk
16	Effects of a Pool of Source Loyalty, Perceived Trustworthiness, Perceived Credibility, Perceived Professionalism, Perceived Familiarity, Perceived Expertise, Perceived Image, Personal Involvement, and Company Involvement on Perceived Risk

Table 2 (Continued)

Hypothesis #	Hypotheses Contents
17	Effects of a Pool of Source Loyalty, Perceived Trustworthiness, Perceived Credibility, Perceived Professionalism, Perceived Familiarity, Perceived Expertise, Perceived Image, Personal Involvement, and Company Involvement on the Use of Risk Handling Strategies

each of these individual factors and risk propensity, the effect of the pool of these factors on risk propensity was examined. The mutual consideration of these factors may have a different impact on risk propensity. Hence, Hypothesis 9 is proposed to assess the quality of the relationship between the pool of these factors and risk propensity. Each of these hypothesis is presented by its pertinent research question.

Hypothesis 1: age correlate of risk propensity.

There seems to be agreement on the negative association between age and risk propensity. Previous studies suggest that older managers were more risk averse and younger managers were more risk taking (e.g., MacCrimmon and Wehrung 1986). For the sample of industrial purchasing professionals, the following question should be answered: Does age have a significant relation to risk propensity of the industrial purchasing professionals? Thus, the research hypothesis 1 is presented by the pertinent research question.

H1: The younger industrial purchasing professionals will be more risk taking than the older industrial purchasing professionals.

Hypothesis 2: sex correlate of risk propensity. The literature review suggests that women might be more conservative than men when unsure of their decisions and more extreme than men when very sure of their decisions

(Kogan and Wallach 1964). The relationship between risk propensity and sex for the industrial purchasing professionals appears to be dependent upon the level of certainty of the purchasing decisions in question. In this respect, the research hypothesis 2 is designed to examine not only the sex correlate of risk propensity but also the perceived level of uncertainty about the purchasing decision.

H2: The male industrial purchasing professionals will be more risk taking than the female industrial purchasing professionals.

Hypothesis 3: education correlate of risk propensity.

The literature review suggests that the relationship between education and risk propensity is not clear. However, the directionality for the effect of education on risk propensity for the industrial purchasing professionals is based on a study by MacCrimmon and Wehrung (1986) reporting a positive association between risk propensity and education for the sample of managers. The research hypothesis 3 is proposed to figure out whether or not education has a significant relation to risk propensity.

H3: The industrial purchasing professionals with higher education will be more risk taking than the industrial purchasing professionals with lower education.

Hypothesis 4: income correlate of risk propensity.

As with education, the relationship between risk propensity

and income has not been strongly supported. Since MacCrimmon and Wehrung (1986) reported a positive relationship between risk propensity and income for the sample of managers, it is proposed that higher income is related to risk taking for the industrial purchasing professionals.

H4: The industrial purchasing professionals with higher income will be more risk taking than those with lower income.

Hypothesis 5: authority correlate of risk propensity.

The specific relationship between authority and risk propensity is based on a previous study which reports a strong relationship between authority and risk taking (MacCrimmon and Wehrung 1986). Hypothesis 5 is proposed to explore whether authority has a significant effect upon risk propensity of industrial purchasing professionals.

H5: The industrial purchasing professionals with greater authority will be more risk taking than those with less authority.

Hypothesis 6: seniority correlate of risk propensity.

The literature review suggests that there is no clear-cut relationship between seniority and risk propensity. Since seniority is closely related to age, the hypothesized effect of seniority on risk propensity is treated synonymously with the effect of age on risk propensity. It

is proposed that seniority is negatively related to risk taking for the industrial purchasing professionals.

H6: The industrial purchasing professionals with longer seniority will be more risk averse than those with shorter seniority.

Hypothesis 7: job title correlate of risk propensity.

The literature review suggests that there is a significant relationship between risk propensity and position

(MacCrimmon and Wehrung 1986). In general, managers in higher positions are related to greater risk taking.

Hypothesis 7 is proposed to examine the effect of job title on risk propensity.

H7: The risk propensity of the industrial purchasing professionals will vary with different job titles.

Hypothesis 8: firm size correlate of risk propensity.

The hypothesis of decision makers risk taking in larger firms has not been strongly confirmed or disconfirmed.

However, large firms tend to foster managers' risk taking.

In this respect, it is proposed that firm size is positively related to risk taking for the industrial purchasing professionals.

H8: The industrial purchasing professionals in larger firms will be more risk taking than those in smaller firms.

Hypothesis 9: overall influence on risk propensity of the factors influencing risk propensity. Does the pool of factors influencing risk propensity have a significant

effect on the risk propensity of industrial purchasing professionals? The effects of each of these factors on risk propensity may not take mutual consideration of these factors. The extent of the relationship between the pool of these factors and risk propensity is explored via the following hypothesis.

H9: Age, sex, education, income, position, authority, seniority, and the size of firm will show significant effects on the risk propensity of the industrial purchasing professionals.

Set II: Effects of Risk Propensity on the Risk Handling Process

As reported previously, the risk propensity of industrial managers has a major impact upon decision making strategies (Taylor and Dunnette 1974). In the context of industrial buying, the risk propensity of industrial purchasing professionals is expected to influence the process of risk handling. Importantly, the risk propensity of industrial purchasing professionals is expected to have an impact upon risks they perceive in the purchasing situation. Additionally, the strategies which industrial purchasing professionals adopt to cope with the risks are also expected to be determined by the risk propensity of the industrial purchasing professionals. The primary concern of the second set of hypotheses is to investigate

the relationships between the risk propensity of industrial purchasing professionals and the level of perceived risk and specific risk handling strategies selected, respectively.

Hypothesis 10: effect of risk propensity on perceived risk. No previous studies have reported on the effect of risk propensity on perceived risk either in consumer research or in the industrial marketing area. Since the relationship between risk propensity and perceived risk is not clear, the directionality of this relationship may be either positive or negative. To explore this relationship, hypothesis 10 is proposed as follows:

H10: There will exist a significantly positive or negative relationship between the degree of perceived risk and the risk propensity of the industrial purchasing professionals.

Hypothesis 11: effect of risk propensity on risk handling strategies. As with Hypothesis 10, no previous studies have reported on the effect of risk propensity on risk handling strategies. Hypothesis 11 is proposed to investigate the effect of risk propensity of industrial purchasing professionals on their choice of specific risk handling strategies.

H11: There will exist a significant relationship between the risk propensity of the industrial purchasing

professionals and the strategies they adopt to cope with risks.

Set III: Effects on the Risk Handling Process of the Factors Mediating the Risk Handling Process.

The proposed model predicts that the supplier (or buyer) related variables mediate the process of risk handling. Synthesizing and expanding the extant research on the relationships between supplier related factors and the risk handling process (e.g., Newall 1977), four major supplier related factors are considered as research variables. Specifically, (1) source loyalty to existing suppliers, (2) perception of the supplier, (3) source credibility, and (4) degree of involvement are expected to affect the perception of risk and the selection and employment of risk handling strategies. Hypotheses 12, 13-a,b,c,d,e, 14, and 15-a,b are primarily concerned with the relationships between each of these four mediating factors and the level of perceived risk.

Hypothesis 12: effect of source loyalty on perceived risk. Does loyalty to existing suppliers affect the degree of perceived risk in the industrial purchasing? To answer this research question, hypothesis 12 is proposed to examine the effect on perceived risk due to the source loyalty to existing suppliers. With respect to

directionality, higher source loyalty to existing suppliers is expected to be related to less perceived risk.

H12: The more loyal to existing suppliers the industrial purchasing professionals are, the less likely they perceive higher risk.

Hypothesis 13: effect of source credibility on perceived risk. Hypothesis 13 deals with the effect of perceived source credibility on the degree of perceived risk. As indicated previously, the construct of perceived credibility of the supplier includes the following dimensions: perceived trustworthiness, perceived expertise, perceived credibility, perceived professionalism, and perceived familiarity. In fact, Hypothesis 13 involves the effects of each of the individual dimensions on the degree of perceived risk. It is expected that the hypothesized relationships between perceived risk and each of the individual dimensions are negative. For example, lower level of perceived trustworthiness is expected to lead to higher perceived risk. The effects of each dimension on perceived risk are addressed under Hypotheses 13-a,b,c,d, and e.

H13-a: The more trustworthy the industrial purchasing professionals perceive the supplier, the less likely they perceive higher risk.

H13-b: The more credible the industrial purchasing professionals perceive the supplier, the less likely they perceive higher risk.

H13-c: The more professional the industrial purchasing professionals perceive the supplier, the less likely they perceive higher risk.

H13-d: The more familiar the industrial purchasing professionals perceive the supplier, the less likely they perceive higher risk.

H13-e: The more expert the industrial purchasing professionals perceive the supplier, the less likely they perceive higher risk.

Hypothesis 14: effect of image on perceived risk.

Does the perceived image of the supplier influence the degree of perceived risk in the industrial purchasing?

Hypothesis 14 is proposed to clarify the relationship between perceived image and perceived risk. The proposed model predicts that the perceived image of the supplier selected will affect the degree of perceived risk. Directionally, higher perceived risk is expected to be related to the perceived image of the supplier in a negative manner.

H14: The more positive the industrial purchasing professionals perceive the supplier, the less likely they perceive higher risk.

Hypothesis 15: effect of involvement on perceived risk. Hypothesis 15 deals with the effect of involvement on perceived risk. The hypothesized effect of involvement on perceived risk is quite contrary to the effects of the other mediating factors on perceived risk. When industrial purchasing professionals perceive the purchasing decision to be critical, they are expected to perceive higher risk. That is, to "feel involved" in the purchasing decision is expected to lead to higher perceived risk. The construct of involvement may involve two separate dimensions: personal and company. The manner in which industrial purchasing professionals respond to the personal dimension of involvement might be different from their response to the company dimension of involvement. Higher levels of both dimensions, however, are expected to lead to a higher degree of perceived risk. In this respect, two specific research hypotheses dealing with both dimensions are addressed under Hypothesis 15.

H15-a: The more critical the industrial purchasing professionals perceive the purchasing decision personally, the more likely they perceive higher risk.

H15-b: The more critical to the company the industrial purchasing professionals perceive the purchasing decision, the more likely they perceive higher risk.

Hypothesis 16: effects on perceived risk of the factors mediating the risk handling process. In addition

to the specific relationships between perceived risk and each of the supplier related mediating factors, the effect of the pool of these mediating factors was examined. The mutual consideration of these factors may influence the degree of perceived risk in a different manner. Thus, Hypothesis 16 is proposed to assess the quality of the relationships between the pool of these factors and perceived risk.

H16: Source loyalty, perceived trustworthiness, perceived expertise, perceived familiarity, perceived professionalism, perceived credibility, perceived image, company involvement, and personal involvement will show significant effects on perceived risk.

Hypothesis 17: effects on the risk handling strategies of the factors mediating the risk handling process. Finally, the selection of risk handling strategies is expected to be significantly affected by (1) degree of source loyalty to existing suppliers, (2) source credibility, (3) perceived image of the supplier, and (4) degree of involvement. Thus, Hypothesis 17 deals with the effects of these supplier related factors on the selection and employment of risk handling strategies.

H17: The risk handling strategies selected by the industrial purchasing professionals will significantly vary with their (1) loyalty to existing suppliers, (2) source

credibility, (3) perceived image of the supplier, and (4) involvement level in the purchasing decision.

Research Methodology

Study Focus and Research Method

The research method selected for this study is a nationwide mail survey. Mail questionnaires were sent to purchasing professionals from the membership list of the Chemical Division of the National Association of Purchasing Management (N.A.P.M.). As Sweeney et al. (1973) suggested, the members involved in N.A.P.M. are assumed to exert a major influence in most of the firm's buying decisions, and are also assumed to be deeply involved in many important industrial purchases in the chemical industry.

This research was limited to a single-decision participant study. A decision-making-unit (DMU) typically consists of multiple decision participants who have varying perspectives on the purchase and exhibit quite different types of buying behavior. Considering the exploratory nature of this study, the present research did not take it into consideration that an industrial buying decision is the result of a number of members from different sources in the buying center. For example, engineers might be involved in purchasing chemical materials, they were not considered in this study.

The selection of a single respondent from each firm can also be justified by the study of Putto et al. (1986). Putto et al. suggested that a substantial portion of industrial modified rebuy vendor selection decisions might be made by individual decision makers rather than by groups. Apparently, the individual decision maker is still an important force for industrial marketers to consider in designing the sales and marketing efforts of the firm. Importantly, the chemical industry turned out to be an example of modified rebuy selection decisions during the pretesting of the questionnaire. Typically, as in a modified rebuy, those chemical buyers appeared to be involved in the process of supplier search, supplier evaluation and supplier selection. The choice of chemical industry seemed to be most relevant to the nature of this study.

In order to focus the research on actual industrial buying behavior rather than perceived or potential buying behavior, the retrospective buying decision process was investigated. The study of actual purchasing behavior offers substantial advantages. The retrospective buying decision process presents a more realistic view of the decision process. A major problem with the study of potential buying behavior is that research using prospective decisions often make the unrealistic assumption that complex organizations will behave the way people think

they will behave. In addition, this study asked respondents to recall the last purchasing decision in which at least two competitive suppliers were involved over the past twelve months. This question better facilitated the respondents to recall the purchase by asking the respondents to think back over the past twelve months about how they made decisions when they purchase materials. Second, perceived risk was elicited by asking the respondents to consider the purchasing situation where two competitive suppliers were involved.

The Sample

Survey participants were selected from the membership roster of the Chemical Division of the National Association of Purchasing Management (N.A.P.M.). The membership roster provided by N.A.P.M. for their Chemical Division included 1285 members. Hence, the sampling frame included 1285 members of N.A.P.M. Out of the 1285, twenty-five members were excluded in the selection procedure because their addresses were not available in the membership roster. This sampling procedure was not probabilistic; instead it was based on convenience sampling.

The use of the N.A.P.M. membership roster offered some advantages to increase the quality of the study in two ways. First, the membership roster afforded the ability to select those who are involved in the purchasing of the

basic chemical materials for their firms. The membership roster also helped to select a very representative body of the industrial purchasing decision participants in the chemical industry. Twenty four job titles of the respondents substantiates this claim. Second, it was thought that the participants might initially want to withhold information about both the purchasing decision and their personal background. The concern of confidentiality might be lessened by using a reliable and dependable source of research. The sponsorship of N.A.P.M. and the support of the Graduate Business School, University of Tennessee helped to reduce these concerns.

Data Gathering Method

The survey was mailed to all 1260 members listed in the membership roster of the Chemical Division of the N.A.P.M. To increase response, a number of suggested mail survey techniques based on the Total Design Method (TDM) were adopted. TDM is "an identification of each aspect of the survey process that may affect response quantity or quality and shaping them in a way that will encourage good response" (Dillman 1978). High responses in several mail surveys using TDM were reported. Dillman (1978) reported response rates averaging 74% for 48 nonbusiness surveys using the TDM in whole, or in part. Walker et al. (1987) recently reported response rates averaging 65.3% for two

surveys of business populations. Thus, these comparatively high responses demonstrate that the TDM can be effective in marketing-related surveys of industrial populations.

A period of two months was allocated for data collection. During the period of data gathering, three mailings were conducted. First, a letter of introduction from the President of the Chemical Division of the N.A.P.M. was mailed to all the members. This letter was used as a way of introducing the purpose of this research and its importance to the participants, specifying that the questionnaire would be sent within a week, and appealing to the participants to complete and return the questionnaire as soon as possible (see Appendix A). In a few days, a second mailing was sent to the same participants and included a personalized cover letter from the researcher, the questionnaire itself, and an envelope with pre-paid return response. Appendix B presents the cover letter and the questionnaire. Third, a follow-up letter was mailed to all the participants two weeks later as a reminder of the importance of each response to the study (see Appendix C).

The first mailing of the survey resulted in 376 responses. Of this 376 responses, 340 were usable. Of the 36 that were not usable, twenty were not eligible because the purchasing professionals were no longer employed in the field of purchasing chemical materials. And the remaining 16 were returned due to an incorrect address. The

follow-up letter resulted in 199 additional responses. A total of 539 usable questionnaires were received. This left an overall response rate of 44.2% (539/1220) overall. In addition, the initial response rate on the first mailing of the survey was 27.9% (340/1220), while the response rate due to the follow-up letter was 16.3% (199/1220). Four questionnaires were excluded in the data analysis due to the late return. Thus, 535 responses were used in the data analysis. Figure 6 presents the summary of responses in this mail survey.

Nonresponse bias. The responses were classified by the time period when each response was received to determine whether there exists any nonresponse bias. The first group of responses was received prior to the mailing of the follow-up letter. The second group of responses was received after the mailing of the follow-up letter. Canonical discriminant analysis was performed on these response categories to establish the bias in the results that might be distinct between those who responded and those who did not respond. The attributes of the nonrespondents were assumed to be similar to the trend between early and late respondents. The results of univariate F tests indicate, as shown in Table 3, that there do not exist significant differences between the two groups with respect to each of the research variables. None of the research variables showed significant

Sampling Frame		1285
Addresses Unavailable	(25)	
Total Mailing		1260
Total Number of the Questionnaire Returned		579
Incorrect Addresses	(16)	
No Longer Employment	(20)	
Late Return	(4)	
	(40)	
Total Number of the Questionnaire Usable		539
Response Rate = $539/1220 = 44.2\%$		

Figure 6: Summary of Responses of the Mail Survey

Table 3: Univariate F Tests from Canonical Discriminant Analysis for Nonresponse Bias

Variable	F	Significance
<u>Factors Affecting Risk Propensity</u>		
Age	.002	.9627
Income	.208	.6484
Sex	.346	.5564
Education	.734	.3921
Firm Size	.131	.7180
Years Purchasing Experience	.523	.4700
Years in Position	.078	.7795
Authority	.461	.4977
<u>Perceived Risk</u>		
Perceived Risk	.009	.9259
<u>Risk Handling Strategies</u>		
# 1	1.090	.2970
# 2	.072	.7880
# 3	.000	.9851
# 4	.010	.9221
# 5	2.364	.1248
# 6	.800	.3715
# 7	.644	.4225
# 8	.276	.5993
# 9	.816	.3667
#10	2.887	.0899
#11	.025	.8740
#12	.300	.5843
#13	.276	.5995
#14	.100	.7514
#15	1.366	.2430
<u>Risk Propensity</u>		
Risk Propensity	.016	.9009

Table 3 (Continued)

Variable	F	Significance
<u>Mediating Factors</u>		
<u>Influencing the Risk</u>		
<u>Handling Process</u>		
Personal Involvement	.012	.9142
Company Involvement	.020	.8879
Perceived Image	3.146	.0767
Perceived Trustworthiness	.858	.3548
Perceived Expertise	2.309	.1292
Perceived Familiarity	1.035	.3093
Perceived Credibility	.018	.8940
Perceived Professionalism	.050	.8223
Source Loyalty	.511	.4748

discriminant power between the two groups. Consequently, there appears to be no concern for nonresponse bias for this study.

Instruments for Data Collection

Personal Interviews

First of all, in addition to the literature review, personal interviews were conducted in the Knoxville, Tennessee area, with four purchasing managers at chemical companies. These purchasing managers were involved in initiating the order of basic chemical materials and making purchasing decisions for the materials. There were two major purposes for the personal interviews. First, the interviews were held to gain preliminary insights into the purchasing decision making process for basic materials in the chemical firms. Additionally, the interviews aided in the development and refinement of the survey questionnaire. The following specific questions were used in the personal interviews.

1. What criteria were used for the selection of suppliers during the purchasing decision for materials?
2. What strategies were used for handling risks during the purchasing decision for materials?
3. Who was the most influential decision maker during the purchasing?

4. How important was the loyalty to the previous suppliers during the purchasing decision making?

5. How critical was the purchasing decision to the purchasing decision maker and to the company?

6. How important were the source credibility and the general impression on the supplying companies and the vendors during the purchasing decision making?

Development of Mail Questionnaire

The mail questionnaire was developed for the present study as an efficient means of obtaining detailed information from purchasing decision participants. Appendix B presents the mail questionnaire. The mail questionnaire is divided into four parts. Part I asks the buyers about four supplier related mediating variables. Part II asks the buyers about the level of perceived risk and risk handling strategies which they may use in the industrial buying situations. Part III contains the revised risk propensity measure. Part IV contains questions for general information on the buyer and buying company. The research variables corresponding to the items on the questionnaire are presented in Table 4.

The questionnaire was pretested with four purchasing managers at Plasti-line, Rohm and Hass, ALCOA, and Eastman Kodak Company. Those companies were selected for convenience with respect to location. During the

Table 4: Research Variables Examined in the Survey

Part	Question #	Research Variables
I	1	Source Loyalty*
	2	Source Loyalty**
	3	Personal Involvement in the Purchasing Decision
	4	Company Involvement in the Purchasing Decision
	5-1	Perceived Trustworthiness of the Supplier
	5-2	Perceived Expertise of the Supplier
	5-3	Perceived Familiarity with the Supplier
	5-4	Perceived Credibility of the Supplier
	5-5	Perceived Image of the Supplier
	5-6	Perceived Professionalism on the Supplier
II	1-1	Importance Component of Perceived Risk
	1-2	Uncertainty Component of Perceived Risk
	2	Risk Handling Strategies
III	1-12	Risk Propensity Measure
IV	1	Years Purchasing Experience
	2	Years in Position
	3	Job Title
	4	Level of Authority
	5	Amount of Authority
	6	Gender
	7	Age
	8	Education
	9	Number of Employees
	10	Income

* Indirect Measure of Source Loyalty Using a Dichotomous Scale

** Direct Measure of Source Loyalty Using a Semantic Differential Scale

discussion, all of the purchasing managers seemed to understand the questionnaire items. The first draft of the questionnaire was refined based on the responses of first two purchasing managers and their additional recommendations. A revised draft was developed after meeting with ALCOA and Eastman Kodak purchasing managers.

Measurements of the Research Variables

The research variables are operationally defined. Then, the measures for the research variables are discussed. Finally, validity and reliability of the measures are discussed, as well.

Operational Definitions of the Research Variables

1. Factors Affecting Risk Propensity

AGE	The age of the respondent.
EDUCATION	The respondent's highest level of education.
SEX	The sex of the respondent.
INCOME	The respondent's 1987 before tax earned income.
POSITION	The respondent's job title.
SENIORITY	Two separate measures were used. (1) years purchasing experience and (2) years in the present position.
COMPANY SIZE	The size of the organization by number of employees.

2. Risk Propensity

RISK PROPENSITY	An average score over the ten items selected from the Kogan and Wallach's Choice Dilemma Instrument.
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3. Risk Handling Process

PERCEIVED RISK	The multiplication of the degree of importance and the degree of uncertainty for each of the 19 risk components in the industrial purchasing setting. The degree of importance was measured on a Likert scale ranging from 1-"VERY IMPORTANT" to 5-"NOT IMPORTANT." The degree of uncertainty was measured on a Likert scale ranging from 1-"VERY CERTAIN" to 5-"VERY CERTAIN."
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RISK HANDLING STRATEGIES	Factor scores obtained via factor analysis of 15 risk handling strategies were used as an indicator of the degree of employment of risk handling strategies. The use of each of the 15 risk handling strategies was measured on a Likert scale ranging from 1-"VERY MUCH" to 5-"NOT AT ALL."
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4. Mediating Factors Influencing Risk Handling Process

LOYALTY TO EXISTING SUPPLIER	The perceived loyalty to the previous suppliers associated with the purchasing decision making in question. Measured on a semantic differential scale ranging from 1-"VERY LOYAL" to 7-"NOT LOYAL."
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SOURCE CREDIBILITY	The individual scores on perceived trustworthiness, expertise, familiarity, credibility, and professionalism on the supplier selected. As measured on semantic differential scales ranging from 1-"UNTRUSTWORTHY," to 7-"TRUSTWORTHY," from 1-"EXPERT," to 7-"NON EXPERT," from 1-"FAMILIAR," to 7-" UNFAMILIAR," from 1-"NOT CREDIBLE," to 7-" CREDIBLE," and from 1-"UNPROFESSIONAL" to 7-"PROFESSIONAL."
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PERCEPTION OF THE SUPPLIER The perceived image of the supplier selected. As measured on a semantic differential scale ranging from 1-"POSITIVE IMAGE," to 7-"NEGATIVE IMAGE."

INVOLVEMENT Two separate one-item measures were used. One was designed to measure personal involvement; the other was designed for company involvement. The scores on how critical the decision was to (1) a decision maker and to (2) a company. As measured on semantic differential scales ranging from 1-"VERY CRITICAL" to 7-"NOT CRITICAL."

Measures for the Factors Influencing Risk Propensity

The measures for the following variables are quite self-explanatory: age, education, sex, income, job position, and company size. Two separate scales were used to measure the variable of seniority. They included (1) years purchasing experience and (2) years in the present position.

Risk Propensity Measure

The Choice Dilemmas Instrument (CDI) developed by Kogan and Wallach (1964) was primarily used to measure the risk propensity of industrial purchasing professionals. CDI offers some advantages over other measures of risk propensity. First, CDI is considered as a standard risk attitude questionnaire. This is substantiated by the extensive use of CDI in the previous risk-related research (e.g., Slovic 1962; Rim 1963; Schaninger 1964; Weinstein 1969; Vroom and Pahl 1971; Taylor and Dunnette 1974; Newton

1976; Brown and McCollough 1976; Reingen (1976); Hensley 1977; Ziegler 1977; Martin 1978; Bonoma and Johnston 1979; Brockhaus 1980; Hutchison and Lilienthal 1980).

Importantly, CDI was used in the consumer context by Hensley (1977) and Schaninger (1964). It is also noteworthy that CDI was employed for the sample of industrial managers by Taylor and Dunnette (1974). Likewise, Brockhaus (1980) obtained the risk propensity of entrepreneurs via CDI. Thus, after a thorough search of the literature, CDI appeared to be the most widely used, and the most appropriate instrument for the present research.

Second, reliability for CDI was reported as satisfactory. For example, Kogan and Wallach (1961), using the Spearman-Brown formula, reported split-half reliability coefficients as .53 for young males, .63 for young females, .80 for older males, and .80 for older females. They concluded that these reported reliability coefficients could be considered satisfactory for a twelve-item measure. Ziegler (1977), in his dissertational research, reported an item correlation between the test-retest as .72, which is above the satisfactory reliability of .7 (Nunnally 1979).

Third, the situational characteristics of risk propensity is well embedded in the Kogan and Wallach's Instrument. By dealing with twelve different risk

situations, the risk propensity measure well reflects the situational characteristics of risk propensity.

The original CDI was modified in some ways. First, the original risk propensity measure was refined and purified via reliability analysis and factor analysis. Through the screening procedure, two items which deal with foreign investment (Question #6) and marriage choice (Question #12), respectively were deleted out of the original twelve-item risk propensity measure. Hence, ten items were employed to capture the construct of risk propensity. The ten items involve situations such as job choice (Question #1), personal investment (Question #2), heart operation (Question #3), prison escape (Question #4), football game (Question #5), college choice (Question #7), chess move (Question #8), occupational choice (Question #9), research choice (Question #10), and political choice (Question #11).

Second, the order of the questions in the original measure of risk propensity was changed. This change was done to adjust spaces during the development of the questionnaire. Third, some money values were updated. For example, a \$4,000 life insurance policy in Question #3 from the original measure was changed to \$30,000 life insurance policy. These changes were inevitable in that the original measure was developed in 1964. The revised amount of money was judgmentally determined by expert opinions. Similarly,

some other events were also updated. For example, the Vietnam War was substituted for World War II. Finally, a portion of instructions were refined based again on expert opinions.

To measure risk propensity, the respondents were asked to place themselves in the central decision-making role of a given situation. In each situation, the subjects were confronted with a two-choice dilemma. They could play it safe and avoid taking any risk; but the rewards of this alternative were small. On the other hand, they could choose a riskier alternative where the rewards are lucrative but less certain. The subjects were asked to indicate by means of a check mark the lowest probability of attainment for the higher value payoff that he/she would consider acceptable before recommending that the high-risk alternative be chosen. The available probabilities in each situation consisted of 1 in 10, 3 in 10, 5 in 10, 7 in 10, and 9 in 10 for attainment of the higher value payoff. In addition, the subject had the option of rejecting the higher value payoff no matter what the probabilities. In this option, the probability of 10 in 10 was given. The numerical values of 1,3,5,7,9 and 10 was scored for each option. The overall average score of the selected item scores was used as an index of risk propensity of the industrial purchasing decision participants for this particular study. The use of the average score over the

selected item score was suggested by most of the previous studies. An exception was a study by Newton (1976) in which each item score instead of an average score was used as a indicator of risk propensity for each item situation.

On a relative basis, responses 1 and 3 might be considered risky; 5 and 7 might be considered moderate; and 9 and 10 could be considered as very conservative. Higher scores are associated with greater conservatism, while lower scores are associated with greater risk taking (Kogan and Wallach 1964). Any possible order-preference effect on choice of probability levels was counterbalanced by arranging the response categories in one direction on the odd items and in the reverse direction on the even items.

Perceived Risk Measure

Perceived risk was measured on the basis of a multiplicative measure of perceived risk. First, for each of the 19 supplier selection criteria, two responses on the importance question and the uncertainty question were multiplied. Then, for each individual, an average score over the 19 supplier selection criteria was obtained.

The importance dimension was measured on a Likert scale ranging from 1-"VERY IMPORTANT" to 5-"UNIMPORTANT." The uncertainty dimension was measured on a Likert scale ranging from 1-"VERY CERTAIN" to 5-"VERY UNCERTAIN." For the purpose of calculation of perceived risk, the score the

importance dimension was reversed. The possible degree of perceived risk ranges 1 to 25.

The supplier selection criteria include two product related variables such as cost of material and quality of material; three salesperson related variables such as confidence in the salesperson, dependability of the salesperson, and effectiveness of the salesperson; and the 14 supplying company related variables such as ability to deliver on schedule, service, technical capability, production facilities, overall reputation, bidding compliance, financial status of the supplier, innovative nature, geographic location for shipping, company ethics, packaging capability, attitude toward buyer, dependability of promises made, and capability of supplying future demand.

The multiplicative measure of perceived risk seems to be the most widely used, and theoretically supported by multiattribute models of attitude in consumer research (Dowling 1986). Although the strengths and limitations of multiattribute attitude models have been reviewed by some consumer researchers (e.g., Wilkie and Pessemier 1973), perceived risk researchers seem to have relied on the multiattribute models of attitude where the multiplication of beliefs (similar to uncertainty) and importance (similar to adverse consequences) has widespread support (Dowling 1986). Additionally, the multiplicative measure of

perceived risk well reflects the conceptualization of perceived risk not only as a function of uncertainty and consequences (importance) but also as a multidimensional phenomenon.

Risk Handling Strategy Measure

The respondents were asked how much they relied on each of the 15 risk handling strategies when they chose the particular supplier. Each of the strategies was measured on a Likert scale ranging from 1-"VERY MUCH" to 5-"NOT AT ALL." Then, factor scores obtained via factor analysis of the strategies were used as an indicator of the employment of the risk handling strategies. The choice of the following risk handling strategies was based on the basis of the previous research.

1. Consult with top management before making decisions;
2. Search for additional published information;
3. Negotiate with potential suppliers for a better price;
4. Prefer well-known suppliers with good reputations;
5. Consult with buyers in other firms about their experience with potential suppliers;
6. Arrange for visits to potential suppliers;
7. Negotiate a penalty clause in the contract;

8. Prefer previous suppliers with whom you are familiar;
9. Consult with experts for their opinion;
10. Split the order among potential suppliers;
11. Seek top management commitment from supplying company;
12. Make decisions after a greater deliberation;
13. Consult with manufacturing people about rescheduling production;
14. Select relatively nearby suppliers;
15. Rely on past experience.

Measures for the Supplier Related Factors Mediating the Risk Handling Process

Source loyalty. To measure source loyalty, the respondents were asked how they would characterize their loyalty to the previous supplier. A semantic differential scale was used which ranged from 1-"VERY LOYAL," to 7-"NOT LOYAL."

Source credibility. The construct of source credibility involved the following five dimensions: perceived trustworthiness, expertise, familiarity, credibility, and professionalism on the supplier selected. The respondents were asked to describe the supplier they selected on each of these dimensions. Perceived trustworthiness was measured on a semantic differential

scale which ranged from 1-"UNTRUSTWORTHY," to 7-"TRUSTWORTHY." Similarly, the other scales range from 1-"EXPERT," to 7-"NONEXPERT" for perceived expertise; from 1-"FAMILIAR," to 7-"UNFAMILIAR" for perceived familiarity; from 1-"NOT CREDIBLE," to 7-"CREDIBLE" for perceived credibility; and from 1-"UNPROFESSIONAL" to 7-"PROFESSIONAL" for perceived professionalism.

Perceived image. The perceived image was measured on a semantic differential scale ranging from 1-"POSITIVE IMAGE," to 7-"NEGATIVE IMAGE."

Involvement. The degree of involvement was measured on two dimensions: personal involvement and company involvement. The respondents were asked to describe how critical the purchase decision they selected was to their company and to themselves. Both dimensions were measured on semantic differential scales which ranged from 1-"VERY CRITICAL" to 7-"NOT CRITICAL."

Reliability Check of the Measures

Reliability of the measures of risk propensity, the risk handling strategies, source credibility, and perceived risk was examined via Cronbach's Coefficient Alpha (1951). Cronbach's Alpha is considered one of the strongest reliability indexes since it provides the lower bound of reliability coefficients (Peter 1979). The Cronbach's Alpha was obtained using the SPSS-X computerized

statistical package (SPSS 1988). Table 5 presents the results of the reliability analysis of the measures. Those measures which did not consist of multiple items were excluded from the consideration of reliability in that the calculation of the reliability coefficients are generally limited to multiple item scales.

The result of the reliability coefficient (.627) for the twelve-item Kogan and Wallach's risk propensity measure indicates that the degree of internal consistency in twelve items in the industrial purchasing setting conforms to those reported in different settings.

Although the reliability coefficient for the twelve-item risk propensity measure used in this research appeared acceptable, the responses to the twelve items may not be quite consistent. The investigation of the item-to-total correlations among the twelve items confirmed the inconsistent response tendency. Therefore, this twelve-item measure needs some purification and refinement to increase reliability. The satisfactory level of reliability with respect to Cronbach's Alpha was suggested as .7 (Nunnally 1978). The procedure of this purification is discussed in the risk propensity measurement section in the next chapter.

Other measures in addition to risk propensity show relatively high reliability coefficients: .71 for the risk handling strategy measure, .73 for the source credibility

Table 5: Reliability Analysis for the Instruments

Variable	Item to Total Correlation
<u>Risk Propensity</u>	
# 1	.3053
# 2	.3038
# 3	.3033
# 4	.2926
# 5	.2943
# 6	.1534
# 7	.3014
# 8	.2671
# 9	.2652
#10	.3979
#11	.2591
#12	.1639
Alpha = .6271	
<u>Risk Handling Strategies</u>	
# 1	.3385
# 2	.4311
# 3	.3360
# 4	.2364
# 5	.3609
# 6	.3442
# 7	.3689
# 8	.1204
# 9	.4315
#10	.1164
#11	.4325
#12	.4463
#13	.4315
#14	.1061
#15	.1527
Alpha = .7078	
<u>Source Credibility</u>	
Perceived Trustworthiness	.4402
Perceived Expertise	.5127
Perceived Credibility	.5242
Perceived Professionalism	.5061
Perceived Familiarity	.5666
Alpha = .7327	

Table 5 (Continued)

Variable	Item to Total Correlation
<u>Importance Dimension</u>	
# 1	.0804
# 2	.5137
# 3	.3482
# 4	.5168
# 5	.4812
# 6	.4158
# 7	.5751
# 8	.5078
# 9	.2764
#10	.4177
#11	.5459
#12	.4793
#13	.2633
#14	.5338
#15	.4193
#16	.4456
#17	.5772
#18	.4266
#19	.4220
Alpha = .8408	
<u>Uncertainty Dimension</u>	
# 1	.3239
# 2	.5497
# 3	.5401
# 4	.6082
# 5	.4869
# 6	.5042
# 7	.5342
# 8	.5336
# 9	.5093
#10	.3894
#11	.4376
#12	.4414
#13	.2753
#14	.5321
#15	.4000
#16	.5593
#17	.5948
#18	.6029
#19	.5835
Alpha = .8782	

measure. As previously indicated, the measure of perceived risk was measured via the importance and uncertainty dimensions. The reliability coefficients for the importance and uncertainty dimensions in the perceived risk measure were .84 and .88, respectively. These results also were substantiated by the relatively high item-to-total correlations for those measures. In summary, each of the individual measures except for the risk propensity measures showed quite consistent response patterns.

Validity Check of the Measures

The previous literature review section and experts' opinion sought during the pretesting of the questionnaire, actually contribute to the content validity, both face validity and sampling validity.

Jackson et al. (1972) reported that the Kogan and Wallach's Risk Propensity Instrument has substantial evidence for convergent and discriminant validity both from correlation and factor analysis data. For this research, the validity of the risk propensity measure was estimated by comparing item mean scores reported in other studies. Newton (1976), in his dissertational research, reported mean scores for the sample of certified public accountants on risk situations. In comparison to this study, the response tendency was quite consistent except Question #4 (prison-of-war escape) and Question #9 (occupational

choice). Cecil (1967) also reported mean scores on risk situations using university students. Compared with this study, the response tendency was very consistent except Question #9 (occupational choice). Therefore, the use and replication of the Kogan and Wallach's Instrument by different researchers would appear to support validity of the risk propensity measure. Table 6 summarizes the mean scores reported by the different studies.

The basic principles of multitrait-multimethod matrix suggested by Campbell and Fiske (1959) was applied in order to investigate construct validity. In this particular study, it was not possible to make a complete test of construct validity because information on correlations of different variables by different methods could not be obtained. Therefore, only a partial test of the construct validity of the measures was performed via correlation analysis.

The convergent validity of the source loyalty scale was assessed via Pearson product moment correlation coefficient between the dichotomous nominal scale in Question #1 and the semantic differential scale in Question #2. The respondents who selected the previous supplier showed moderately high source loyalty. This significant result gives support for the convergent validity of the source loyalty measure.

Table 6: Means Scores on Each Item in the Risk Propensity Measure

Item Content	Question #	Mean [*]	Mean ^{**}	Mean ^{***}
Football Game	5	4.05	3.72	4.17
Chess Move	8	4.14	3.54	4.39
Research Choice	10	4.86	4.47	4.86
POW Escape	4	4.99	5.35	4.39
College Choice	7	5.19	4.80	5.61
Job Choice	1	5.43	5.00	5.22
Occupational Choice	9	6.36	7.06	7.09
Political Choice	11	6.65	6.90	5.89
Personal Investment	2	7.22	6.80	6.40
Heart Operation	3	7.29	6.39	6.54
Marriage Choice	12	7.48	7.41	7.93
Foreign Investment	6	8.65	8.06	7.88

* Mean Scores for the Sample of Chemical Purchasing Professionals

** Mean Scores for the Sample of Certified Public Accountants

*** Mean Scores for the Sample of University Students

Note: The possible range of a mean score is from 1 (risk taking) to 10 (risk averse) for each item.

Table 7 presents the results of the correlation analyses. The convergent validity of the perceived risk measure was assessed via Pearson product moment correlation coefficients between the following two alternate measurement techniques: a multiplicative model and an additive model. Table 8 presents the results of this correlation analyses. The results indicated that the alternate measurement models are highly correlated with each other, and hence the perceived risk measure contains high convergent validity.

Moreover, the correlation between the two components of the perceived risk construct was examined to evaluate the discriminant validity of the perceived risk scale. Table presents the results of this correlation analyses. These two components would be expected to be uncorrelated with each other in that the uncertainty component and the importance component were supposed to measure different dimensions. Interestingly, the correlation was highly negative ($-.526$). Two explanations can be made for this negative correlation. First, it is possible that each component measured two different dimensions. Thus, this result supported the discriminant validity of the perceived risk measure. Second, the respondents might have been confused in responding to the uncertainty dimension. The respondents might have equated "Important" with "Certain"

Table 7: Correlation Analysis between Nominal Measure and Semantic Differential Measure for Source Loyalty

Correlation Coefficient	Significance
.24618	.0001

Table 8: Correlation Analysis between the Degree of Perceived Risk Obtained from the Multiplicative Measure and the Additive Measure

Correlation Coefficient	Significance
.8244	.0001

and "Unimportant" with "Uncertain." In fact, the majority of the respondents answered either "Important" and "Certain" or "Unimportant" and "Uncertain". Unfortunately, the ideal response might be either "Important" and "Uncertain" or "Unimportant" and "Certain", so the degree of perceived risk would be well differentiated.

In summary, the scales for source loyalty and perceived risk dimensions showed satisfactory levels of convergent validity.

Summary

The reliability analyses indicated that each of the measures except for the risk propensity measure have satisfactory levels of internal consistency. The scales for source loyalty and both dimensions of perceived risk showed satisfactory levels of convergent validity. The validity of the risk propensity measure was supported as well.

CHAPTER IV

DATA ANALYSIS AND RESULTS

This chapter begins with a profile of the respondents. The remainder of the sections reports the results of data analysis. Table 9 summarizes statistical procedures to test the proposed hypotheses.

Description of Respondents

A profile of the respondents is presented primarily with information about the respondents and their company. Information about the respondents includes age, sex, education, income, job titles, years purchasing experience and years in the present position. For company information, firm size and the degree and amount of authority are described, as well. The interrelationships between these variables are described on the basis of the correlation coefficients (see Appendix Table D-1).

Age. The age of the respondents ranged from 22 to 68. The average age was 43.9. On the average, male respondents were older than female respondents. Older respondents earned higher income. Age was positively correlated with both years purchasing experience and years in the present position. In general, older respondents were employed at larger firms than younger respondents.

Table 9: Summary of Statistical Procedures to Test
Research Hypotheses

Hypothesis	Statistical Procedure
Correlates of Risk Propensity	Correlation Analysis Regression Analysis Canonical Correlation Analysis
Effect of Risk Propensity on Perceived Risk	Correlation Analysis
Effect of Risk Propensity on Risk Handling Strategies	Factor Analysis Cluster Analysis Analysis of Variance
Effects on Perceived Risk of the Factors Mediating the Risk Handling Process	Correlation Analysis Regression Analysis
Effects on Risk Handling Strategies of the Factors Mediating the Risk Handling Process	Factor Analysis Cluster Analysis Discriminant Analysis

Sex. Out of 535 responses, the portion of male chemical purchasing professionals was 79.4%. On the average, male respondents showed higher levels of education. Male respondents were employed at larger firms and earned higher income. Additionally, male respondents had more years in purchasing experience and in the present position.

Education. Over ninety percent of the respondents were at least college educated. Only eight percent of the respondents were only high school graduates. The portion of the respondents with bachelor's degree was the highest (37.9%). Only two respondents hold doctoral degrees and twenty-one percent of the respondents hold master's degree. In general, the respondents with higher education earned more income and were employed at larger firms.

Income. Sixty percent of the respondents fall into the income range between \$30,000 and \$59,000. Both income ranges between \$20,000 and \$29,999, and between \$30,000 and \$39,999 equally showed the highest responses (20.3%). Ten percent of the respondents had income over \$80,000, while only three percent had income below \$20,000. In general, the respondents with higher income were employed at larger firms and had more years of purchasing experience and were in their present positions longer.

Job titles. About seventy percent of the respondents were either purchasing managers, purchasing agents, or purchasing directors. Among these three categories, the portion of purchasing managers were the highest. The remainder of the job titles include buyer (10.5%), purchasing representative (0.8%), procurement manager (1.5%), purchasing supervisor (3.8%), material manager (7.1%), senior buyer (5.8%), and vice president of purchasing (3.2%).

Seniority. Two measures were used. They included both the number of years purchasing experience during their careers and also years in their present position. Seniority during their careers ranged from 1 to 44 years. The average seniority during the career was 13.4 years. Seniority in the present position ranged from 1 to 30 years with average seniority in the present position being 5.7 years. Both measures of seniority were highly correlated each other, as one might expect.

Authority. Out of 534 responses, 46.3% answered that they do not have a limit they can approve without further authorization for purchasing materials. The rest of 53.7% indicated that they did have a limit. The average dollar limit was \$727,233. Over 80% of the respondents indicated that they have final authority for the purchase of materials. The degree of authority was positively correlated with years of purchasing experience. However,

authority was not significantly correlated with the number of years in the present position. Interestingly, the respondents which were employed in smaller firms were given more authority.

Size of firms. Over 45% of the respondents were employed at firms with less than 500 employees. Forty-four percent of the respondents indicated that they were employed at firms with more than 1,000 employees. Only 10% of the respondents were employed at firms with employees more than 500 and less than 1,000.

Determinants of Risk Propensity

The following steps were taken to examine the determinants of risk propensity. First, the structure in the original 12 item measure of risk propensity was explored via correlation analysis and item analysis to gain insight into that structure. The item analysis included the investigation of the means and standard deviations for each of the twelve items. Second, the risk propensity measure was purified via item-to-total correlation analysis and factor analysis. Third, basic statistical relationship analyses were conducted to investigate the relationship between risk propensity and each individual independent variables, and the pool of independent variables. These tests included correlation and multiple regression analyses. In addition, canonical correlation analysis was

added to examine the interrelationship between independent variables (factors influencing risk propensity) and a set of dependent variables (ten items in the risk propensity measure). Importantly, individual items in the risk propensity measure were used as a set of dependent variables.

Risk Propensity Measurement

First of all, the means for each of the twelve situations were examined to determine the situations which the respondents considered most risky and least risky. Table 10 presents the means and standard deviations for each item in the original risk propensity measure.

Surprisingly, neither the critical life or death situations (the heart operation--Question #3 and the prison-of-war escape dilemma--Question #4) were considered as the most risky decisions. Instead, the respondents were willing to bear the least amount of risk on question #6 which dealt with a foreign investment. The mean of this question was 8.65, which means the group of industrial purchasing professionals would undertake the foreign investment only if there was approximately an 87 percent chance of success. Thus, the respondent's attitude toward Question #6 was very risk averse.

Table 10: Means Scores and Standard Deviations on Each Item
in the Risk Propensity Measure

Item Content	Question #	Mean	Standard Deviation
Football Game	5	4.05	2.58
Chess Move	8	4.14	2.71
Research Choice	10	4.86	2.18
Prison of War Escape	4	4.99	2.74
College choice	7	5.19	2.46
Job Choice	1	5.43	1.97
Occupational Choice	9	6.36	2.95
Political Choice	11	6.65	2.42
Personal Investment	2	7.22	2.46
Heart Operation	3	7.29	2.20
Marriage Choice	12	7.48	2.38
Foreign Investment	6	8.65	2.00

Note: The possible range of a mean score is from 1 (risk taking) to 10 (risk averse) for each item.

In contrast, the situation considered least risky was Question #5 which dealt with a football game. The mean response to this situation was only 4.05, which indicates that the industrial purchasing decision participants would go for a risk play even though the chance of success was as low as 40 percent. Therefore, the respondents assumed more risk.

The standard deviation was also computed on each question to determine those questions on where there was the greatest amount of disagreement among the respondents. The widest disagreement was recorded in Question #9 which dealt with the occupational choice dilemma. The standard deviation for the question was 2.95. The respondents were in closest agreement on Question #1, a job choice decision where the standard deviation of the responses was 1.97.

The relationships which underlie the risk situations have been analyzed to determine whether the questions measured the same risk traits. A correlation matrix was calculated for the twelve questions to determine if a linear relationship exists between any pair of questions. The questions with the strongest correlations are presented below.

<u>Questions</u>	<u>Correlation Coefficients</u>
Q5 and Q8	.302
Q3 and Q4	.279
Q7 and Q10	.271
Q1 and Q10	.270

These relationships have rational explanations. Questions #1, #7, and #10 are all employment or task related situations. Questions #3 and #4 are both life or death situations, while Questions #5 and #8 are both game situations. All other correlations were smaller than these (see Appendix Table D-2).

The previous reliability analyses suggested that the internal consistency of the original twelve-item risk propensity measure (.6271) was below the satisfactory level of reliability. Nunnally (1978) suggested that reliability of .7 or higher will suffice in the early stages of research on predictor tests or hypothesized measures of a construct. Thus, the original risk propensity measure was refined and purified to increase reliability. This procedure of purification involved the following steps which were consistent with Churchill's paradigm for developing better measures of marketing constructs (Churchill 1979). First, the item-to-total correlations for the 12 items were examined to delete items with low item-to-total correlations. Question #6 and Question #12 were deleted because their item-to-total correlations were substantially low. The item-to-total correlation coefficients for Question #6 and #12 were .1534 and .1639, respectively. Second, factor analysis on the purified 10 item measure of risk propensity was performed to verify the dimensionality of the new measure. Figure 7 presents the

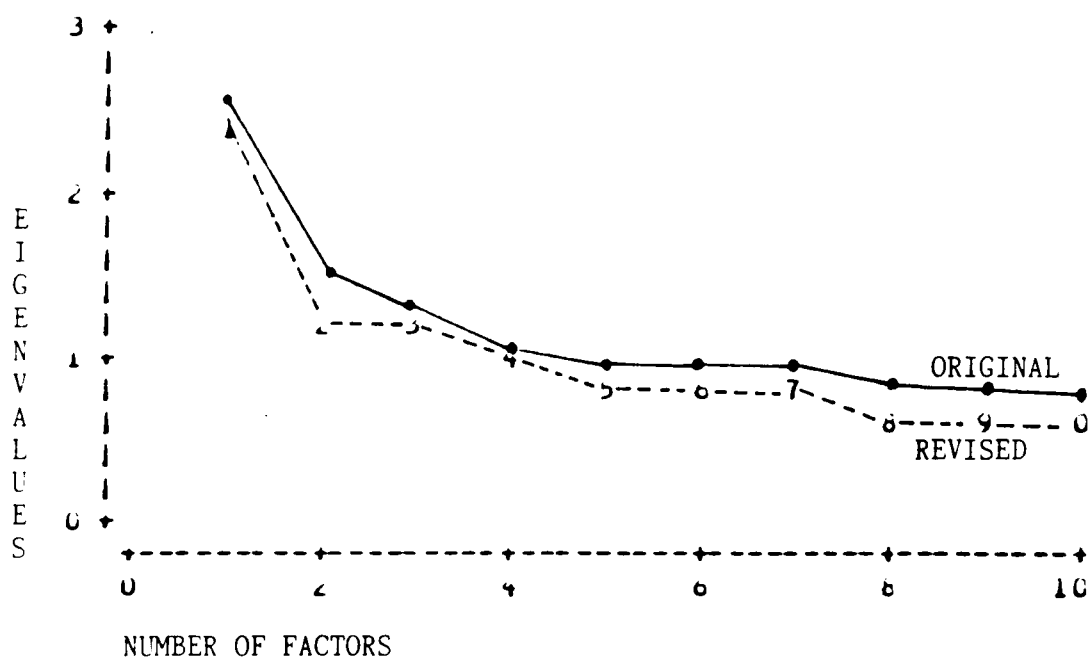


Figure 7: Scree Plots for the Revised Measure of Risk Propensity and the Original Measure of Risk Propensity

results of scree tests for both instruments of risk propensity. The dimensionality of the revised instrument was compared with that of the original instrument of risk propensity. Quite clearly, the one-factor solution is better represented in the revised measure of risk propensity than in the original measure of risk propensity. Hence, the revised measure of risk propensity is considered to have considerable internal homogeneity. Finally, the Cronbach's Alpha for this new measure was assessed and the item-to-total correlations were examined for the 10 items. The new Cronbach's Alpha for the purified 10 item measure was .6275 and the item-to-total correlations coefficients were improved. Normally, decreasing in the number of items on a scale decreases the reliability of the scale (Peter 1979). In this respect, the small amount of increase in Cronbach's Alpha (from .6271 to .6275) may be considered to be a substantial increase in that this increase happened in spite of the negative effect of the reduced number of items on the reliability of the scale. However, this new coefficient Alpha was still unsatisfactory. Table 11 presents the results of reliability analysis for both of the risk propensity measures.

The degree of a respondent's risk propensity was obtained as a mean score of these 10 item scores. Those items excluded dealt with foreign investment (Question #6) and marriage choice (Question #12). The mean scores for

Table 11: Reliability Analysis for the Original Risk Propensity Instrument and the Revised Risk Propensity Instrument

Question Number	<u>Item to Total Correlation</u>	
	Original measure	Revised Measure
# 1	.3053	.3004
# 2	.3038	.2643
# 3	.3033	.2911
# 4	.2926	.3017
# 5	.2943	.3173
# 6	.1534	
# 7	.3014	.3026
# 8	.2671	.3041
# 9	.2652	.2537
#10	.3979	.4333
#11	.2591	.2241
#12	.1639	
	Alpha=.6271	Alpha=.6275

the 10 item measure ranged from 4.05 to 7.29. The overall average of the 10 item scores was 5.62. Here, the lower the mean score is, the more risk taking a respondent is.

Correlates of Risk Propensity

Correlates of risk propensity were examined via correlation analyses, regression analyses, and canonical correlation analyses. Findings of these analyses are reported next.

Findings of correlation analyses. Correlation analyses were used to test Hypotheses 1, 2, 3, 4, 5, 6, and 8. Pearson product moment correlation coefficients and the corresponding significance probabilities were used to assess the relationships between each individual independent variable and the dependent variable of risk propensity. Those independent variables used were age, education, gender, income, authority, years purchasing experience, years in position, and firm size. These correlation analyses assumed that the population is bivariate normally distributed on the variables of interest. In this respect, the ordinal scales for education, income, and firm size were treated as ordinal-interval scales because their construction implies equal appearing intervals between the numerical points. Sex was also treated as a continuous variable for this correlation analysis.

As shown in Table 12, the results of correlation analyses support a significant relationship between risk propensity and years of purchasing experience. The correlation coefficient was .093. The positive correlation suggests that the chemical purchasing professionals with longer seniority during their careers were more risk averse. As expected, the longer the chemical purchasing professionals were involved, the more risk averse they were likely to become. The remainder of the relationships proved insignificant.

The results of correlation analyses appeared to be quite contradictory to those of previous research. It might conceivably be that the results here might be true only for this sample of chemical industrial buyers. More possibly, the minimal number of significant results might be due to the measure of risk propensity. More research is needed to determine if risk propensity was appropriately measured.

To test Hypothesis 7, a general linear model was used because the response categories of job title might not allow any order of hierarchy. Thus, a one degree of freedom test cannot be used for the variable of job position. Six major job titles out of ten categories of job positions were used to determine whether there is any significant difference in risk propensity among the job positions. The six job titles used in the data analysis

Table 12: Correlation Analysis for Correlates of Risk Propensity

Variable	Risk Propensity
Age	.025 (.562) *
Authority	.050 (.254)
Sex	-.037 (.393)
Education	-.051 (.237)
Income	.014 (.755)
Firm Size	.022 (.607)
Years Purchasing Experience	.093 (.032)
Years in Present Position	.037 (.390)

* Significance Probabilities Corresponding to Pearson Correlation coefficients

included purchasing manager (34.5%), director of purchasing (17.1%), purchasing agent (15.8%), buyer (10.5%), material manager (7.1%), and senior buyer (5.8%). These job titles takes the majority of the responses (90.8%). Tasks assigned to each job position are considered to be quite different (Purchasing World 1987). The nationwide survey conducted by Purchasing World indicated that the job descriptions for each position were quite differentiated. As shown in Table 13, the result indicates that there is no effect on risk propensity due to the job title.

Table 13: F Test for the Effect of Job Titles on Risk Propensity

Source	F Value	Significance
Job Titles	0.73	.5982

Findings of regression analyses. The use of correlation analyses lacks the mutual consideration of the independent variables. To test Hypothesis 9, multiple regression analyses were used to assess the relationship between the dependent variable of risk propensity and the pool of the following independent variables: age, education, sex, income, authority, years purchasing experience, years in the present position, and firm size. Coefficient of determination and overall F tests were

examined to assess the quality of the relationship between the pool of independent variables and the dependent variable. T tests were used to examine the incremental contribution of each individual coefficient to the explanation and prediction of the risk propensity of the respondents. In fact, the t test is an equivalent way to perform the partial F test for the variable added to the regression model. The use of t tests over F tests in this study is due to the advantage of beta coefficients that help to explore the direction of relationships between a response variable and individual predictors.

A significance probability of .05 was established as an acceptable level of significance. The selection of the .05 level of significance is generally considered to be the minimum for interpretation (Hair, Anderson, and Tatham 1987). This level is not necessarily required in all situations, however, and researchers from various disciplines frequently must rely on results based on this level of significance. The results of t tests in the regression model can be explained by comparing the fit of complete and reduced models. The complete model, for all of these tests, contains all the independent variables. The reduced model contains all these variables except the one being tested. The complete form of this multiple regression model can be represented as follows:

$$y = b_0 + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 \\ + b_7x_7 + b_8x_8$$

where, y = risk propensity.

x_1 = age.

x_2 = authority.

x_3 = sex.

x_4 = education.

x_5 = firm size.

x_6 = income.

x_7 = years purchasing experience.

x_8 = years in position.

The variables of education, gender, income, and firm size were designed as ordered categorical variables in the questionnaire. Since there was no need to lose degrees of freedom and power, these categorical variables were treated as continuous variables in the regression model.

A lack-of-fit test was used to determine whether the proposed regression model fit the model with classes for the categorical variables. The F statistic was compared with an appropriate critical point of the F distribution, which has 14 and 490 degrees of freedom in the numerator and denominator, respectively. For Alpha=.05, it was found that $F=1.132 < F_{14,490,.95}=1.71$, and thus a null hypothesis that the use of classes for the categorical variables in the regression model is not worthwhile was not rejected.

The F test result indicated that the one degree of freedom tests in the proposed model is as appropriate as the model with classes for the categorical variables. Table 14 summarizes the results of this F test.

First of all, the Pearson product moment correlation coefficients was examined to determine whether multicollinearity was a problem (see Appendix Table D-1). Multicollinearity might lead to unstable estimates of regression coefficients and P values. Yet, the difficulty is that there is no statistical test that can determine whether or not multicollinearity really is a problem. However, searching for high correlation coefficients was recommended to be a better informal method to determine if multicollinearity was a problem (Schroeder et al. 1986). The study of correlation coefficients between pairs of variables used in this multiple regression model implies that multicollinearity was not a problem.

The overall F test in the regression analysis suggests that the pool of independent variables does not show a significant power to explain and predict risk propensity. The low coefficient of determination (.027) indicates this low predictive and explanatory power. The results of t tests suggests that only the variable of years purchasing experience has a significant effect on risk propensity and the direction of the effect is positive (.02278). Table 15 presents the results of the regression

Table 14: F Test for Lack-of-Fit

Source of Variation	SS	df	MS
SSE	689.80	504	
Lack of Fit	21.61	14	MSLF=1.544
Pure Error	668.19	490	MSPE=1.364
F=MSLF/MSPE=1.132			

Table 15: Regression Analysis for the Effects on Risk Propensity of the Factors Influencing Risk Propensity

Dependent Variable: Risk Propensity

Parameter	Parameter Estimate	Significance
Age	-.01402	.0744
Authority	.00162	.5230
Sex	-.09288	.5235
Education	-.09299	.0821
Firm Size	-.01608	.6106
Income	.02643	.5064
Years Purchasing Experience	.02278	.0137
Years in Position	-.00136	.9120
Coefficient of Determination=.027		
Overall F=1.76		
Overall Significance=.083		

analysis.

Findings of canonical correlation analyses.

Canonical correlation analysis was used to study the interrelationships among a set of multiple independent variables (age, sex, education, authority, income, years purchasing experience, years in position, and firm size) and a set of dependent variables (10 items in the risk propensity measure). The previous multiple regression analysis was employed to predict a single dependent variable of risk propensity from a set of multiple independent variables. But this canonical correlation analysis was used to predict 10 multiple dependent variables in the risk propensity measure from the same set of multiple independent variables. The minimal number of significant relationships between risk propensity and each individual independent variables might possibly due to a wide variation across 10 item scores in the risk propensity measure. Hence, the main purpose of this canonical correlation analysis was to examine whether there exist any significant relationships between a set of items in the risk propensity measure and independent variables.

Table 16 presents the results of canonical correlation analyses. Two sets of canonical variables proved to have significant relationships. The first set of canonical variables had an adjusted canonical correlation of .2756.

Table 16: Canonical Correlation Analysis for the
Determinants of Risk Propensity

	Adjusted Canonical Correlation	F	Significance
1	.2756	1.9089	.000
2	.2483	1.4607	.011
3		1.1454	.209
4		.9318	.602
5		.7202	.876
6		.5248	.962
7		.4864	.924
8		.3142	.905

As shown in Table 17 and 18, the linear composites of sex, education, firm size, income, and years purchasing experience had a significant relationship with the linear composites of Question #5, Question #8 and Question #9 in the risk propensity measure. The second set of canonical variables had an adjusted canonical correlation of .2483. As shown in Table 17 and 18, the linear composites of age, education, and income had a significant relationship with only Question #1 in the risk propensity measure.

Two observations are important. First, in spite of minimal numbers of significant relationships shown in the previous correlation analysis, there still existed significant relationships between a set of independent variables and a set of items in the risk propensity measure. Overall, the independent variables of age, education, and income showed significant relationships with Question #1, Question #8, and Question #9. Second, the composite of Question #1, Question #8, and Question #9 in the risk propensity measure might possibly be an indicator of risk propensity given those independent variables.

Summary

The correlation and regression analysis indicated that the relationship between risk propensity and years purchasing experience proved to be significant. The rest of the hypotheses were disconfirmed. However, the

Table 17: Correlations between the Independent Variables
for Risk Propensity and Their Canonical
Variables

Independent Variable	CAN1	CAN2
Age	.3178	.3996
Authority	-.1102	-.1465
Sex	-.7914	.2052
Education	.4112	.5713
Firm Size	.5845	-.0926
Income	.8079	.4531
Years Purchasing Experience	.3630	.0536
Years in Position	.0571	.0012

Note: Criterion of Correlation=.35

Table 18: Correlations between Items in the Risk Propensity Measure and Their Canonical Variables

Item Content	Question #	CAN1	CAN2
Job Choice	1	.0112	-.8416
Personal Investment	2	-.1028	-.0038
Heart Operation	3	.2268	-.1215
POW Escape	4	.2927	.2666
Football Game	5	-.3704	-.0804
College Choice	7	.2299	-.1462
Chess Movement	8	-.4920	-.2355
Occupational Choice	9	.5101	-.2692
Research Choice	10	-.2346	-.1440
Political Choice	11	.2441	.0228

Note: Criterion of Correlation=.35

canonical correlation analysis suggested that there still exist significant relationships between age, education, and income with the selected items in the risk propensity measure. Importantly, further research must be focused on the measurement of risk propensity. The question should be addressed as to the appropriate way of measuring risk propensity.

The Effects of Risk Propensity and Supplier Related Mediating Factors on Perceived Risk

First, perceived risk was measured via the multiplicative measure of perceived risk. Second, the relationship between risk propensity and perceived risk was examined via correlation analysis to test Hypothesis 10. Third, the relationships between perceived risk and supplier related mediating factors were then examined via correlation analysis to test Hypotheses 12, 13, 14, and 15. Finally, with a multiple regression model, the quality of the relationships between perceived risk and the pool of the supplier related factors mediating the risk handling process.

Perceived Risk Measurement

As described previously, the degree of perceived risk was obtained via the multiplicative measure of perceived risk. First, for each of the 19 supplier selection

criteria, the scores on the importance dimension and on the uncertainty dimension were multiplied. Then, for each individual respondent, an average score over the 19 supplier selection criteria was used as an indicator of perceived risk.

The Effect of Risk Propensity on Perceived Risk

The relationship between risk propensity and the degree of perceived risk was examined via Pearson product moment correlation coefficients. As shown in Table 19, the result of correlation analyses indicated there did not exist a significant relationship between risk propensity and perceived risk.

Table 19: Correlation Analysis between Perceived Risk and Risk Propensity

Variable	Perceived Risk
Risk Propensity	.01045* (.8121)

* Significance Probability for Pearson Correlation Coefficient

The conclusion is that the effect of risk propensity on the degree of perceived risk was insignificant. The degree of perceived risk might have no bearing on risk propensity. Given the results in this study, the linkage between perceived risk and risk propensity in the proposed

model seemed to be insignificant. Again, the question should be addressed as to the appropriate way of measuring risk propensity.

The Effects of Supplier Related Mediating Factors on Perceived Risk

Pearson product moment correlation coefficients and the corresponding significance probabilities are presented in Table 20.

Effect of source loyalty on perceived risk. Does loyalty to existing suppliers affect the degree of perceived risk in the industrial purchasing? If this relationship exists, how are the levels of perceived risk and source loyalty related? The results of correlation analyses indicate that there did exist a significant relationship between source loyalty and perceived risk. The correlation coefficient was $-.094$. Directionally, greater source loyalty is related to lower perceived risk. As expected, the industrial purchasing professionals who prefer to the previous suppliers perceive lower risk in the purchasing situation. Hence, the hypothesized effect of source loyalty on perceived risk was confirmed.

Effect of perceived trustworthiness on perceived risk. Do perceived trustworthiness of the supplier have

Table 20: Correlation Analysis between Perceived Risk and the Supplier Related Factors Mediating the Risk Handling Process

Variable	Perceived Risk
<u>Involvement</u>	
Personal Involvement	.035 (.453) *
Company Involvement	.036 (.438)
<u>Perceived Image</u>	
Perceived Image	-.180 (.000)
<u>Source Credibility</u>	
Perceived Trustworthiness	-.224 (.000)
Perceived Expertise	-.140 (.002)
Perceived Familiarity	-.194 (.000)
Perceived Credibility	-.171 (.000)
Perceived Professionalism	-.203 (.000)
<u>Source Loyalty</u>	
Source Loyalty	-.094 (.041)

* Significance Probabilities Corresponding to Pearson Correlation coefficients

any relationship with buyer's perceived risk? If this relationship exists, what is the relationship between these two constructs? The results of correlation analyses indicate that there exists a significant relationship between perceived trustworthiness and perceived risk. The correlation coefficient was $-.224$. Directionally, the negative correlation between the two constructs suggests that perceived trustworthiness is negatively related to perceived risk. As expected, the chemical purchasing professionals perceive lower risk when they perceived the supplier trustworthy. Hence, the hypothesized effect of perceived trustworthiness on perceived risk was confirmed.

Effect of perceived expertise on perceived risk.

Does perceived expertise of the supplier affect the degree of perceived risk in the industrial purchasing situation? If this effect exists, how are they related? As shown in the correlation analyses, there exists a significant relationship between perceived expertise and perceived risk. The correlation coefficient was $-.140$. The negative correlation coefficient between the two constructs imply that the more expert the purchasing decision participants perceive the supplier, the less likely they perceive higher risk. This relationship was quite consistent with the hypothesized effect of perceived expertise on perceived risk.

Effect of perceived familiarity on perceived risk.

Does perceived familiarity of the supplier have any relationship with buyer's perceived risk? If so, how are these constructs related with each other? The results of correlation analyses indicate that there exists a significant relationship between perceived risk and perceived familiarity. The correlation coefficient was $-.194$. Directionally, the negative correlation coefficient confirmed the hypothesized effect of perceived familiarity on perceived risk. Hence, as expected, the chemical purchasing professionals perceive lower risk when they perceive the supplier familiar.

Effect of perceived credibility on perceived risk.

Is there any relationship between perceived credibility of the supplier and buyer's perceived risk? If this effect exists, what is the relationship between these constructs? As shown in correlation analyses, there does exist a significant relationship between perceived risk and perceived credibility. The correlation coefficient was $-.171$. The negative correlation coefficient implies that perceived risk is negatively related to perceived credibility. As expected, the hypothesized effect of perceived credibility on perceived risk was confirmed.

Effect of perceived professionalism on perceived risk. Does perceived professionalism of the supplier have any relation to the buyer's perceived risk? If so, how are

the levels of perceived risk and perceived professionalism related? The results of correlation analyses indicate that there exists a significant relationship between perceived risk and perceived professionalism of the supplier. The correlation coefficient was $-.203$. Directionally, perceived professionalism of the supplier was negatively related to perceived risk. That is, the chemical purchasing professionals perceive lower risk when they perceive the supplier professional. Thus, the hypothesized effect of perceived professionalism on perceived risk was confirmed.

Effect of perceived image on perceived risk. Does perceived image on the supplier have any impact upon buyer's perceived risk? If this effect exists, what is the relationship between these constructs? As shown in correlation analyses, perceived image on the supplier has a significant relationship to perceived risk. The correlation coefficient was $-.180$. The negative correlation coefficient confirmed the hypothesized effect of perceived image on perceived risk. As expected, the more positively the chemical purchasing professionals perceive the supplier, the less likely they perceive higher risk.

Effect of personal involvement on perceived risk. Unlike the effects on perceived risk of source loyalty, source credibility, and perceived image, higher personal

involvement in the purchasing situation is expected to be related to higher perceived risk. However, the correlation analyses indicate that there is no significant relationship between personal involvement and perceived risk. The correlation coefficient was .035. Quite interestingly, perceived risk is not affected by how critical the chemical purchasing professionals perceive the purchasing situation.

Effect of company involvement on perceived risk. As with personal involvement, higher company involvement is also expected to be related to higher perceived risk. As shown in correlation analyses, there exist no significant relationship between perceived risk and company involvement. The correlation coefficient was .036. Again, company involvement does not have a significant influence upon perceived risk.

Hypothesis 16 was tested via a multiple regression model to assess the quality of the relationship between the supplier related mediating factors (source loyalty, perceived trustworthiness, perceived professionalism, perceived credibility, perceived expertise, perceived familiarity, perceived image, personal involvement, and company involvement) and the degree of perceived risk. The regression model employed perceived risk as a dependent variable, and the supplier related factors as independent variables.

The coefficient of determination was examined to assess the power of a pool of independent variables to explain and predict perceived risk. In addition, the t tests were used to investigate the effect of each individual independent variable on perceived risk, given other independent variables in the model. The t statistic testing each individual parameter is actually testing whether the complete regression model fits the data better than the reduced regression model containing all independent variables except the independent variable related to the parameter. The level of significance was .05 as a criterion to test hypotheses. The complete form of a multiple regression model can be represented as follows:

$$y = b_0 + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + b_7x_7 + b_8x_8 + b_9x_9$$

where, y = perceived risk.

x_1 = loyalty to existing suppliers.

x_2 = trustworthiness.

x_3 = expertise.

x_4 = familiarity.

x_5 = credibility.

x_6 = professionalism.

x_7 = image.

x_8 = personal involvement.

x_9 = company involvement.

To begin with, the correlation matrix was examined to determine if multicollinearity was a problem. The study of correlation coefficients between the variables under consideration revealed that multicollinearity was not a problem (see Appendix Table D-3). The regression analyses supports a significant effect of the pool of the independent variables on perceived risk. A coefficient of determination .105 indicates that the power of the independent variables to explain and predict perceived risk was not strong. The t tests reveal that perceived trustworthiness, perceived familiarity, and perceived professionalism retain significant incremental effects on perceived risk. Table 21 presents the result of regression analysis.

Summary

Some important conclusions can be made and discussed. First, there was no significant association between risk propensity and perceived risk in the chemical purchasing situations. Second, there exist significant relationships between perceived risk and the following supplier related mediating factors: perceived image, source loyalty, the five dimensions of source credibility. However, these relationships were not strong. There were no significant associations between perceived risk and both involvement dimensions.

Table 21: Regression Analysis for the Effects of Supplier Related Mediating Factors on Perceived Risk

Parameter	Parameter Estimate	Significance
<u>Involvement</u>		
Personal Involvement	.0546	.1862
Company Involvement	.0856	.0910
<u>Perceived Image</u>		
Perceived Image	-.0410	.4873
<u>Source Credibility</u>		
Perceived Trustworthiness	-.0288	.0013
Perceived Expertise	.0013	.9819
Perceived Familiarity	-.1365	.0322
Perceived Credibility	.0605	.5307
Perceived Professionalism	-.1816	.0524
<u>Source Loyalty</u>		
Source Loyalty	-.0103	.8458
Coefficient of Determination=.105		
Overall F=6.57		
Overall Significance=.00		

Regarding directionality, all the hypothesized effects between perceived risk and the supplier related mediating factors were confirmed. There should be further examination why only perceived trustworthiness and perceived familiarity among five components of source credibility made an incremental contribution to the prediction and explanation of perceived risk. It seems that these components are more emotion-attached constructs, while the rest of the components are less emotion-attached. Possibly, those emotion-attached constructs might play a stronger role on influencing the degree of perceived risk.

Risk Handling Strategies: Influences of Risk Propensity
and Supplier Related Mediating Factors

Hypothesis 11 and Hypothesis 17 were tested to explore the influences of risk propensity and supplier related mediating factors on the use of risk handling strategy. For Hypothesis 11, it was hypothesized that there would exist significant differences in risk propensity among groups of respondents classified on the basis of employment of different mixes of risk handling strategies. The result of this relationship is important since it could help to clarify the link of risk propensity with risk handling process. As reported in the previous section, the disconfirmation of Hypothesis 10 implies there does not exist a significant effect of risk propensity on

perceived risk. If Hypothesis 11 is also disconfirmed, the association of risk propensity with risk handling process should be reexamined.

Similarly, the hypothesized relationship for Hypothesis 17 was that the risk handling strategies employed by the respondents would significantly vary with their source loyalty, source credibility, perceived image of the supplier, and the degree of involvement in the purchasing decision. Quite importantly, the thorough understanding of these supplier related mediating factors should help to predict buyer's risk handling strategies. This relationship may serve to improve the buyer-seller relationship, as well. Higher productivity in the industrial field could also be facilitated by the smooth and efficient relationship between buyer and seller.

Some statistical techniques were employed to test Hypothesis 11 and Hypothesis 17. First, the 15 risk handling strategies were factor analyzed to delineate common factors of risk handling strategies. Principal component analysis was used to determine the number of common factors. The iterated principle factor extraction technique via Varimax Rotation was then used to interpret the extracted factors. Factor scores on each derived common factor for each respondent served as input to further cluster analysis. Factor scores are preferred over raw scores in this cluster analysis because factor scores

provide more condensed and parsimonious information on the underlying structure. Another advantage for these factor scores is they are uncorrelated with each other.

Second, using a clustering algorithm, the respondents were classified into groups whose pattern and use of risk handling strategies was differentiated. The nonhierarchical clustering procedure, designed for large data sets (Hair, Anderson, and Tatham 1987), was used to categorize the respondents into three clusters. Two criteria to determine the appropriate number of clusters were used. First, the distance between the the centroids (means) of a cluster and the nearest other clusters was examined. Second, interpretability was considered. A solution which provided a more meaningful interpretation of profiles of the clusters was adopted. Three clusters of the respondents were determined based on the factor scores.

Finally, using canonical discriminant analysis, the differences among the classified groups were examined with respect to the supplier related mediating factors. Especially, canonical discriminant analysis is believed to be an appropriate statistical technique when the dependent variable is categorical and the independent variables are metric (Hair, Anderson, and Tatham 1987). Two specific objectives for applying discriminant analysis for this study are (1) to determine if statistically significant differences exist among a priori defined groups with

respect to the independent variables, and (2) to determine which of the independent variables account most for the differences in the profiles of the a priori defined groups. With the discriminant model, source credibility, source loyalty, the perception of the supplier, and the degree of involvement were used as independent variables to discriminate three a priori classified groups.

The same classified groups were also utilized to test Hypothesis #3 which explores the effect of the risk propensity on the differentiated use of risk handling strategies. With a general linear model, group differences were examined with respect to risk propensity.

Taxonomy of the Risk Handling Strategies

Table 22 presents the mean scores on each risk handling strategy. The respondents used more Strategy #3 ("Negotiate with potential suppliers for a better price."), Strategy #4 ("Prefer well-known suppliers with good reputations."), and Strategy #15 ("Rely on past experiences."). Importantly, the respondents appeared to heavily depend upon the previous suppliers with whom they were familiar. Price negotiation was another risk handling strategy the respondents used more. The strategies which were less used include Strategy #5 ("Consult with buyers in other firms about their experience with potential

Table 22: Mean Scores on Each Risk Handling Strategy

Strategies	Means
Consult with top management before making decisions	3.41
Search for additional published information	3.42
Negotiate with potential suppliers for a better price	1.98
Prefer well-known suppliers with good reputations	1.79
Consult with buyers in other firms about their experience with potential suppliers	3.85
Arrange for visits to potential suppliers	2.85
Negotiate a penalty clause in the contract	3.80
Prefer previous suppliers with whom you are familiar	2.25
Consult with experts for their opinion	3.09
Split the order among potential suppliers	3.33
Seek top management commitment from supplying company	2.68
Make decisions after a greater deliberation	2.70
Consult with manufacturing people about rescheduling production	3.53
Select relatively nearby suppliers	2.92
Rely on past experiences	1.91

Note: The possible range of a mean score is from 1 ("VERY MUCH") to 5 ("NOT AT ALL").

suppliers.") and Strategy #7 ("Negotiate a penalty clause in the contract.").

Factor analysis was applied to the section of risk handling strategies to summarize the important information and to utilize the resulting factor scores in discriminant analysis. Since one of the goals of factor analysis is to obtain common factors that help explain these correlations, the variables must be related to each other for the factor model to be appropriate. If the correlations between variables are small, it is unlikely that they share common factors. The adequacy of the factor model was examined through Bartlett's test of sphericity and Kaiser-Meyer-Olkin measure of sampling adequacy.

Bartlett's test of sphericity was carried out to test the hypothesis that the correlation matrix is an identity matrix. If the hypothesis cannot be rejected, the use of factor analysis should be reconsidered. As shown in Table 23, this test indicated that the correlation matrix is not an identity matrix, that is, the 15 items are interrelated.

Table 23: Bartlett's Test of Sphericity for the Risk Handling Strategy Scale

Chi-square	DF [*]	Significance
1056.9096	105	.00000

* Degree of Freedom = $(N)(N-1)/2$, where N = Number of Variables.

The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was examined to determine how small the partial correlations are relative to the ordinary correlations. Small values for the KMO measure indicate that a factor analysis of the variables may not be a good idea, since correlations between pairs of variables cannot be explained by the other variables. The value of the KMO statistics both overall and for each variable is shown Table 24. Since the overall KMO statistic is close to .8, the factor analysis is appropriate for use (SPSS 1988). Risk handling strategy item #1, #2, #5, #7, #9, #12, #13, and #15 showed very good measures of sampling adequacy. Risk handling strategy item #3, #4, #6, #8, #10, #11, and #14 retained good measures of sampling adequacy, as well. Thus, the study of the correlation matrix revealed that this data set is quite adequate for the factor analytical method.

In determining the number of factors, scree tests and chi-square significance tests associated with the maximum likelihood solution were used in order to obtain the practical and conservative number of factors. Scree tests are believed to be often superior to other methods which use minor factors and the interest is in locating only major common factors (Tucker, Koopman, and Linn 1969).

Chi-square significance tests are known to be the most satisfactory solution from a purely statistical point of view, even though the number of factors retained from

Table 24: Kaiser-Meyer-Olkin Measure of Sampling Adequacy
for the Risk handling Strategy Scale

Item	Measure of Sampling Adequacy
Strategy # 1	.827240
2	.838319
3	.761402
4	.692141
5	.814576
6	.791172
7	.829117
8	.565910
9	.847079
10	.538961
11	.773630
12	.828492
13	.808524
14	.570409
15	.609728

Note: Over-all Measure of Sampling Adequacy=.774

the Chi-square significance test tends to be much larger than the number of appropriate common factors (Kim and Mueller 1978). In this respect, scree test was used for substantive significance, which is applied after finding statistical significance. Akaike's Information Criterion (AIC) and Schwarz's Bayesian Criterion (SBC) were explored to supplement chi-square tests of significance. The number of factors that yields the smallest value of AIS and SBC is considered best (SAS 1985).

Chi-square significance tests showed that six factors are the maximum number of common factors to be extracted. The significance probability levels for the chi-square test are .0001 for one common factor, .0001 for two common factors, .0001 for three common factors, .0005 for four common factors, .0197 for five common factors, and .2237 for six common factors. Table 25 presents the results of chi-square significance tests. Similarly, Akaike's information criterion attained its minimum value at five common factors. However, Schwarz's Bayesian criterion attained its minimum value at two common values. Both criteria are presented in Table 26. Importantly, AIC, like the chi-square test, also tends to include factors that are statistically significant but inconsequential for practical purposes, resulting in a larger number of factors being extracted than is really necessary (SAS 1985). On the other hand, SBC is believed to be less inclined to include

Table 25: Goodness-of-fit Tests for the Adequacy of
Different Factor Solutions

Number of Factors	Chi-square Statistics	Significance
1	368.506	.0001
2	207.796	.0001
3	134.811	.0001
4	91.018	.0005
5	60.509	.0197
6	35.536	.2237

Table 26: Akaike's Information Criterion (AIC) and Schwarz's Bayesian Criterion (SBC) for Different Factor Solutions

Number of Factors	AIC	SBC
1	434.0277	280.4711**
2	299.1911	<u>242.6661</u>
3	251.1965	246.167
4	230.7526	261.3279
5	221.745	280.0917
6	<u>216.3105</u> *	298.5269

* AIC is the lowest at six-factor solution.

** SBC is the lowest at two-factor solution.

trivial factors than either AIC or the chi-square test (SAS 1985). This is evident by the different number of common factors extracted by the alternate criteria. Consequently, those three alternate criteria above indicated that the possible number of common factors to be extracted might range from two to six.

The rule of the scree test is to examine the graph of eigenvalues, and to stop factoring at the point where the eigenvalues begin to level off forming a straight line with an almost horizontal slope (Kim and Mueller 1978). The examination of the graph, as shown in Figure 8, indicated that no more than four common factors should be extracted before the curve first began to straighten out at the point of four common factors. Therefore, the three-factor model seemed to be an adequate representation.

The scree test and chi-square significance tests, including AIC and SBC, showed that three factors may be the logical and conservative number of common factors to be extracted for further analysis. Thus, the three-factor model was employed to investigate factor structure and to derive factor scores.

The common factors were extracted using iterated principle factor analysis, and the extracted common factors were orthogonally rotated via the Varimax method. Principle factor analysis with iteration is the most widely accepted factoring method (Kim and Mueller 1978). The

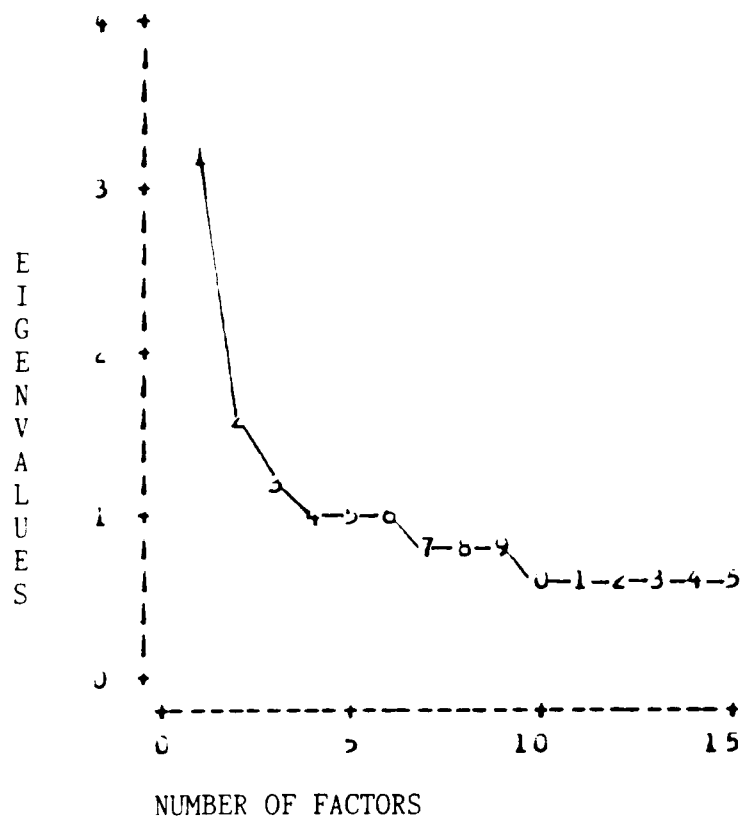


Figure 8: Scree Plot for the Measure of Risk Handling Strategies

Varimax method of rotation was used to maximize the variance of the square of the loading in each column (Harman 1976).

Table 27 presents the Varimax Rotated Factor Pattern based on Iterated Principal Factor Solution using three factors. 0.35 was used as the criterion loading and this criterion has been considered significant (Hair, Anderson, and Tatham 1987). Factor 1 is significantly correlated with the variables 2, 5, 6, 7, 9, and 13 and explains 11.5% of variation of the 15 variables. Factor 2 is significantly correlated with the variables 1, 3, 11, and 12 and explains 8.7% of variation of the 15 variables. Factor 3 is significantly correlated with the variables 4, 8, and 15 and explains 6.8% of variation of the 15 variables. The total proportion of variation of the 15 variables that can be explained by the three factors amounts to 27%. Factor 1 explains 42.6% of that total proportion, factor 2, 32.3% and factor 3, 25.2%. It is evident that each factor can explain a significant portion of the variation of the 15 variables, though factor 1 can account for the largest portion of the variation that can be explained by the three factors.

Evaluating the communality for each variable, these three factors can best explain the variance of variable 5 ("Consult with buyers in other firms about their experience with potential suppliers.") and variable 8 ("Prefer

Table 27: Factor Pattern for the Risk Handling Strategy Items

	Factor1	Factor2	Factor3
Strategy # 1	.22030*	<u>.47663</u>	-.09029
# 2	<u>.45735</u>	.34064	-.04762
# 3	.19256	<u>.35599</u>	.09030
# 4	.09006	.16382	<u>.36367</u>
# 5	<u>.63631</u>	.00847	.03368
# 6	<u>.36323</u>	.21970	.04912
# 7	<u>.52261</u>	.17912	-.07645
# 8	-.06101	.03853	<u>.63098</u>
# 9	<u>.56126</u>	.15884	.09467
#10	-.06435	.23363	.11816
#11	.24401	<u>.49197</u>	.11458
#12	.27116	<u>.56496</u>	.02055
#13	<u>.36373</u>	.26736	.14420
#14	.13898	-.07070	.27656
#15	-.05919	.10632	<u>.56851</u>

* Criterion Loading=.35

previous suppliers with whom you are familiar"). Forty one percent of the variation of variable 5 and forty percent of the variation of variable 8 can be explained by the three factors.

The extracted factors were labeled with respect to the dimensions of perceived risk: importance and uncertainty. Factor 1 has salient loadings by the variables 2, 5, 6, 7, 9 and 13. These variables are related to consulting with others and seeking additional information, and thus, may be synthesized to represent "external uncertainty reduction strategies." Factor 2 has salient loadings by the variables 1, 3, 11 and 12. These variables are related to negotiating, seeking commitment and deliberation before making decisions. In this context, these variables may be synthesized to represent "consequences reduction strategies." Factor 3 has salient loadings by the variables 4, 8 and 15. These variables are closely related to preference of familiar suppliers and well-known suppliers. Thus, these variables may be synthesized to represent "internal uncertainty reduction strategies." Table 28 presents a summary of these risk handling strategies by the common factors.

Table 28: Summary of the Risk Handling Strategies by
Common Factors

Strategies	Factor Loadings
<u>Factor 1</u>	
Consult with buyers in other firms about their experience with potential suppliers	.63631
Consult with experts for their opinion	.56126
Negotiate a penalty clause in the contract	.52261
Search for additional published information	.45735
Consult with manufacturing people about rescheduling production	.36373
<u>Factor 2</u>	
Make decisions after a greater deliberation	.56496
Seek top management commitment from supplying company	.49197
Consult with top management before making decisions	.47663
Negotiate with potential suppliers for a better price	.35599
<u>Factor 3</u>	
Prefer previous suppliers with whom you are familiar	.63098
Rely on past experiences	.56851
Prefer well-known suppliers with good reputations	.36367

Taxonomy of the Respondents

The final step in this factor analysis was to delineate individual respondents scores for the three derived common factors. These factor scores were used as sources to classify the respondents into homogeneous groups employing similar mixes of risk handling strategies.

The next stage of the analysis was to determine whether groups of industrial purchasing decision participants utilized similar mixes of risk handling strategies. The respondents were clustered on the basis of their factor scores extracted in the previous factor analysis. Three factor scores for each individual were then used to cluster the respondents in terms of their similarity with regard to the use of risk handling strategies.

A SAS FASTCLUS procedure, one of the nonhierarchical cluster analysis techniques, was used to classify the respondents into homogeneous risk handling use groups. A nonhierarchical clustering program differs from a hierarchical clustering method only in that the former permits objects to leave one cluster and join another as clusters are being formed if the clustering criterion is improved by doing so (Aaker 1976). While hierarchical clustering tends to be relatively easy to read and interpret, and its output has a logical structure that may be more interpretable given a theoretical basis, a

nonhierarchical clustering was used for three reasons. First, as suggested by Aaker (1976), a nonhierarchical clustering procedure tends to be more reliable than a hierarchical routine. Second, the FASTCLUS procedure is designed for disjoint clustering of very large data sets (SAS 1985). Third, and related to the second, the number of observations used in this research is large enough to reduce the major problem with the FASTCLUS procedure. Thus, this procedure was more appropriate for this data set than any other option.

Two criteria were used in the cluster procedure to determine the appropriate number of homogeneous groups. First, as suggested by Hair et al. (1987), the distance between the centroids (means) of a cluster and the nearest other cluster was examined. Quite simply, the basic logic to examine this distance is to find a solution in which the distance between groups is so distant that the groups can be well separated. The centroid distances in the two-group, three-group, four-group, and five-group solution were compared. As shown in Table 29, the centroid distances between clusters in the three-group solution revealed more distance than in other solutions. Thus, the three-group solution was confirmed. Second, from the practical viewpoint, the three-group solution provided a more meaningful interpretation of profiles of the clusters with respect to cluster means than did other solutions.

Table 29: The Centroid Distances between Clusters in
Two-group, Three-group, Four-group, and
Five-group Solutions

Solution	Cluster Number	Nearest Cluster	Centroid Distance
<u>Two-group</u>			
	1	2	1.4171
	2	1	1.4171
<u>Three-group</u>			
	1	2	1.4981
	2	1	1.4981
	3	1	1.5494
<u>Four-group</u>			
	1	2	1.3188
	2	1	1.3188
	3	1	1.4180
	4	1	1.6846
<u>Five-group</u>			
	1	4	1.2801
	2	3	1.5950
	3	4	1.4161
	4	5	1.2382
	5	4	1.2382

Therefore, the three-group solution appeared the best. In sum, the results of this analysis to determine the number of clusters suggested that the three-group solution should be utilized for the next discriminant analysis. The profiles of the three clusters are described with respect to the use of risk handling strategies in the following ways.

Each of the three clusters was characterized by the means scores on each of the three extracted common factors in Table 30.

The chemical purchasing decision participants were clustered into three groups. The group size for each cluster was 225 for the first group, 176 for the second group, and 107 for the third group.

The group of strategies related to Factor 1 includes "external uncertainty reduction strategies" such as seeking additional published information, and consultation with industrial purchasing experts and buyers in other firms and manufacturing people. The group of strategies related to Factor 2 represents "consequences reduction strategies." This group of strategies includes deliberation before making decisions and seeking top management commitment from supplying company, and negotiating with potential suppliers for a better price. The group of strategies related to Factor 3 includes "internal uncertainty reduction

Table 30: Taxonomy of the Respondents Based on the Risk Handling Strategies (Means and Group Sizes)

Groups	Group I (n=225)	Group II (n=176)	Group III (n=107)
Factor 1	.50019	-.73977	.16503
Factor 2	.40534	-.47488	-.07124
Factor 3	.31870	.25507	-1.08971

strategies." To reduce internal uncertainty, the chemical purchasing decision participants depended heavily upon familiar suppliers and well-known suppliers. They extensively relied upon past experience.

The first group of industrial purchasing decision participants had mean scores of .500 on Factor 1, .405 on Factor 2, and .319 on Factor 3, suggesting that the industrial purchasing decision participants of this group employed each group of strategies in an undifferentiated, balanced manner.

The second group exhibited the highest (absolute) score on Factor 1 (-.740). This group depended more heavily upon strategies related to "information seeking" than the other strategies.

The analysis identified a third group of the industrial purchasing decision participants whose scores on both Factor 1 and Factor 2 were near zero, and their scores on Factor 3 were strong (-1.090). Thus, they used risk handling strategies more extensively, preferring previous suppliers whom they were familiar with and well-known suppliers with good reputations.

In addition to the profiles of the respondents based on the cluster mean scores, the cluster members were plotted with respect to individual respondents' factor

scores. Figure 9 presents the plot of the cluster members on Factor 1 and Factor 2. Figure 10 presents the plot of the cluster members on Factor 2 and Factor 3. Figure 11 presents the plot of the cluster members on Factor 1 and Factor 3.

The differences among the classified groups were examined with respect to the dimensions of perceived risk. First, as shown in Table 31, the groups classified were significantly differentiated with respect to the importance dimension.

The first group perceived the supplier selection criteria more important than the other two groups. When the purchasing professionals perceived the supplier selection criteria quite important, they tended to employ a variety of risk handling strategies. However, there was no difference between the second and the third group in the perceived importance on the supplier selection criteria.

Second, as shown in Table 32, there were also significant differences among the classified groups with respect to the dimension of uncertainty.

Specifically, those who were the most uncertain about the supplier selection criteria heavily employed strategies related to the external uncertainty reduction such as seeking additional information. The second group who depended upon strategies related to internal uncertainty reduction were more uncertain about the supplier selection

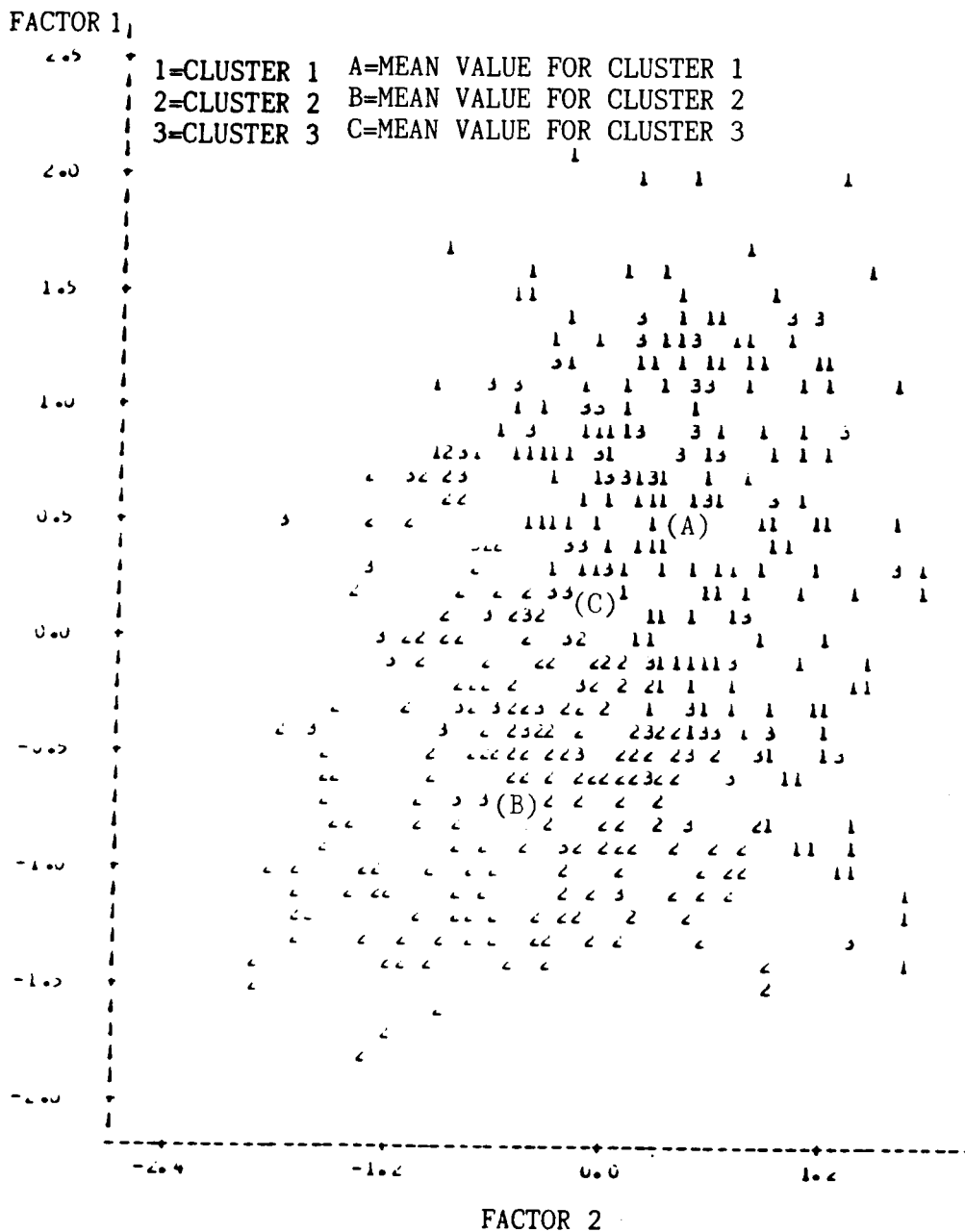


Figure 9: Plot of the Cluster Members on Factor 1 and Factor 2

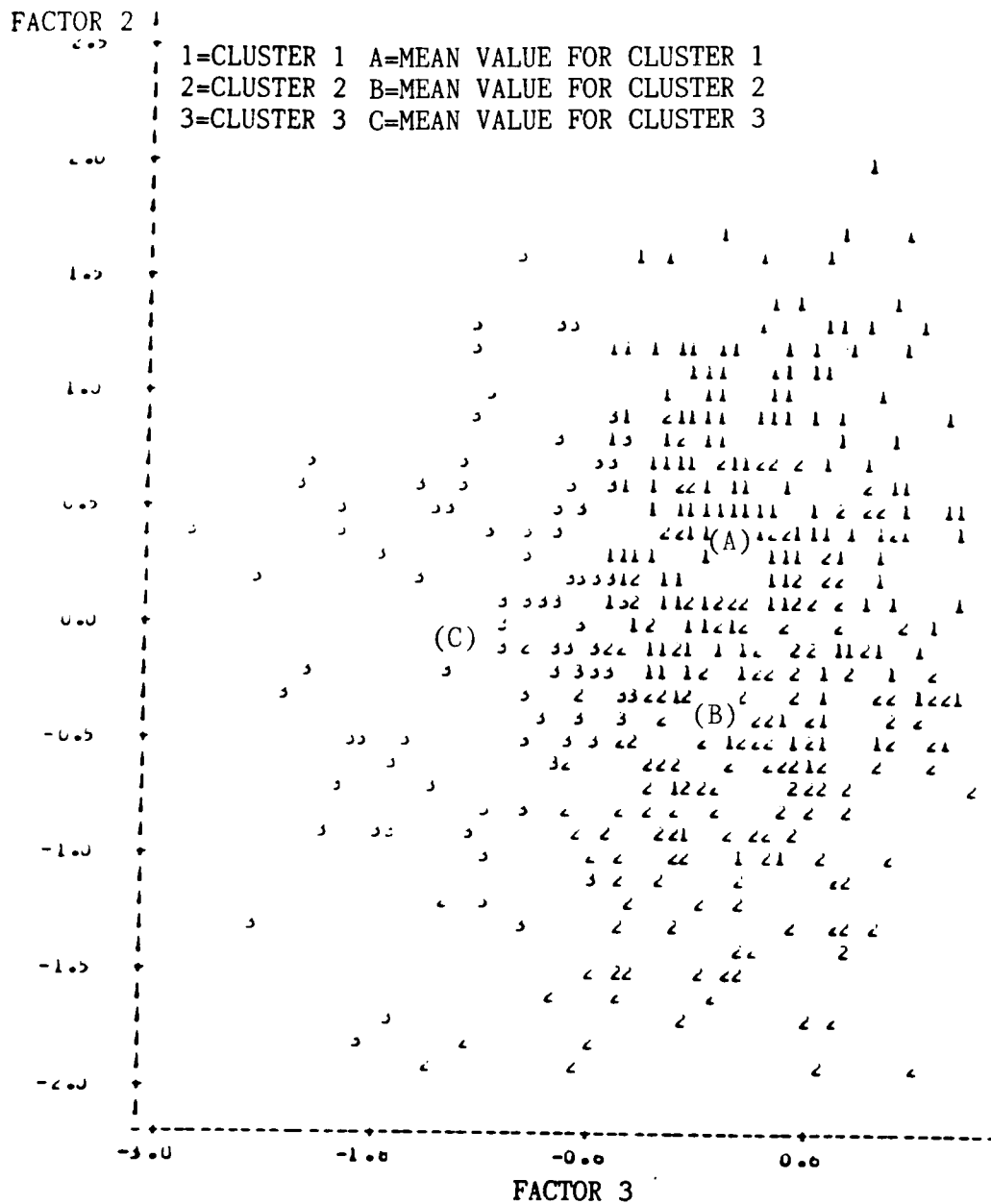


Figure 10: Plot of the Cluster Members on Factor 2 and Factor 3

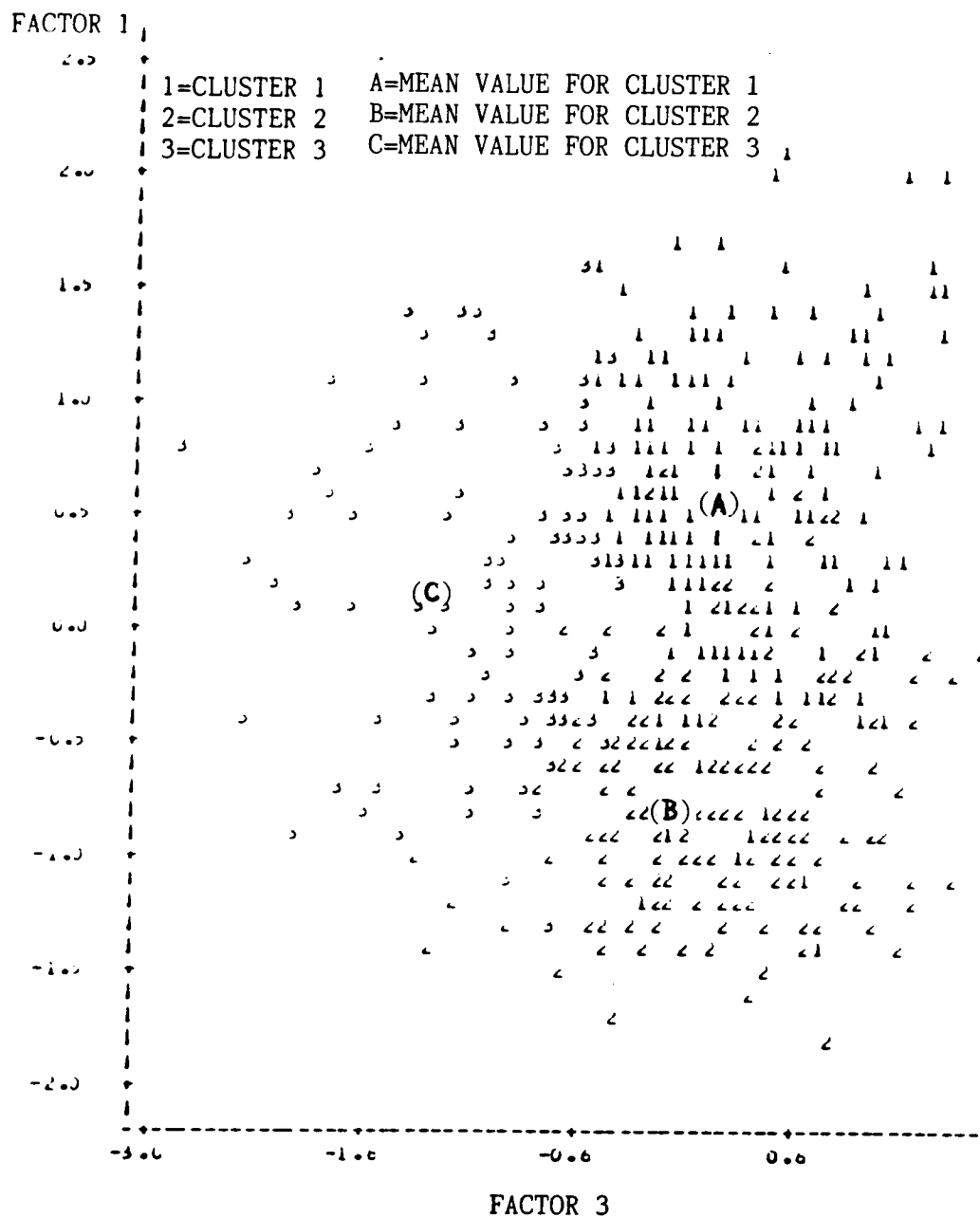


Figure 11: Plot of the Cluster Members on Factor 1 and Factor 3

Table 31: Differences in the Importance Dimension among the Groups Clustered on the Basis of the Risk Handling Strategies

Source	DF	F	Significance
Group	2	17.01	.0001
Group Means	(Group 1 = 4.079) (Group 2 = 3.825) (Group 3 = 3.847)		

Table 32: Differences in the Uncertainty Dimension among the Groups Clustered on the Basis of the Risk Handling Strategies

Source	DF	F	Significance
Group	2	7.71	.0005
Group Means	(Group 1 = 1.825) (Group 2 = 1.961) (Group 3 = 2.039)		

criteria than the first group, but less uncertain about the criteria than the third group. In essence, the purchasing professionals tended to be dependent upon external sources when they felt uncertain about the supplier selection criteria.

Influence of Supplier Related Mediating Factors on the Use of Risk Handling Strategies

First of all, the significance of the canonical variables was assessed. A criterion for significance was established at the .05 level. As previously discussed, this significance level is generally considered to be the minimum for interpretation. The structure correlations between canonical variables and predictors were then studied via total canonical structure. A criterion for significant loadings on canonical variables was established at the .45. No generally accepted guidelines have been established regarding acceptable sizes for loadings on canonical variables. However, this criterion of .45 is considered to be moderately high considering that this research is quite exploratory in nature. Similarly, if the loadings are .4 or greater, they are considered more important in the factor analysis (Hair, Anderson, and Tatham 1987). Finally, univariate test statistics were explored to determine whether each of the individual

predictors could discriminate among the three groups of the respondents.

The canonical discriminant analyses indicated that a first canonical component of the predictors showed significant discriminant power among the three groups of the respondents. However, a second canonical variable might not be a canonical component of predictors which could differentiate among the three groups of the respondents. Table 33 presents the assessment of the significance of the canonical variables.

The first canonical variable contains 62.77% of the total discriminating power in this system of equations. The second canonical variable carries the rest of the portion of the power. These relative proportions indicate that the first canonical component holds a strong discriminating power relative to the second. However, the second canonical component represents a weak discriminating power.

On the first canonical variable, those variables which are important in distinguishing among the three groups consist of personal involvement, company involvement, and perceived expertise. Both involvement constructs contained higher canonical loadings on the first canonical variable. Thus, the first canonical component may be referred to as "involvement dimension." Table 34 presents the structure correlation between the first

Table 33: Canonical Discriminant Analysis for the Effects on the Risk Handling Strategies of the Supplier Related Factors Mediating the Risk Handling Process

Canonical Variable	F	NDF [*]	DDF ^{**}	Significance
1	2.1285	18	980	.0040
2	1.7889	8	491	.0769

* Degree of Freedom for Numerator

** Degree of Freedom for Denominator

Table 34: Correlation between the First Canonical Variable and the Supplier Related Factors Mediating the Risk Handling Process

Predictors	Correlation with the First Canonical Variable
<u>Involvement</u>	
Personal Involvement	.4922
Company Involvement	.7009
<u>Perceived Image</u>	
Perceived Image	-.0467
<u>Source Credibility</u>	
Perceived Trustworthiness	-.0865
Perceived Expertise	.4720
Perceived Familiarity	.1881
Perceived Credibility	.2296
Perceived Professionalism	.0904
<u>Source Loyalty</u>	
Source Loyalty	.2891

canonical variable and predictors of risk handling strategies.

The construct of source loyalty carried the highest canonical loading on the second canonical variable. Thus, the second canonical component may be named as "source loyalty dimension." Again, the second canonical variable, however, turned to be an insignificant discriminator. Table 35 presents the structure correlation between the second canonical variables and predictors of risk handling strategies.

The univariate F tests were examined to determine the contribution of each of the predictors to the overall discrimination. As shown in Table 36, both involvement constructs revealed significant discriminant power among three groups. Source loyalty also proved to be a better discriminator among the three groups. Perceived image and a set of source credibility dimensions turned to be insignificant discriminators among the three groups.

Influence of Risk Propensity on the Use of Risk Handling Strategies

There did not exist significant difference in risk propensity among the groups clustered on the basis of risk handling strategies.

This disconfirmation has a significant implication.

Table 35: Correlation between the Second Canonical Variable and the Supplier Related Factors Mediating the Risk Handling Process

Predictors	Correlations with the Second Canonical Variable
<u>Involvement</u>	
Personal Involvement	.3110
Company Involvement	-.0616
<u>Perceived Image</u>	
Perceived Image	.0285
<u>Source Credibility</u>	
Perceived Trustworthiness	.4753
Perceived Expertise	-.0680
Perceived Familiarity	.2018
Perceived Credibility	.3020
Perceived Professionalism	.1731
<u>Source Loyalty</u>	
Source Loyalty	.7732

Table 36: Univariate F Tests from the Canonical Discriminant Analysis

Predictors	F	Significance
<u>Involvement</u>		
Personal Involvement	3.558	.0292
Company Involvement	5.893	.0030
<u>Perceived Image</u>		
Perceived Image	.031	.9693
<u>Source Credibility</u>		
Perceived Trustworthiness	1.692	.1852
Perceived Expertise	2.659	.0710
Perceived Familiarity	.702	.4962
Perceived Credibility	1.264	.2833
Perceived Professionalism	.307	.7358
<u>Source Loyalty</u>		
Source Loyalty	5.301	.0053

Considering the fact that both relationships of risk propensity to perceived risk and risk handling strategies proved to be insignificant, the link of risk propensity with the process of risk handling should be reexamined. Table 37 presents the results of the analysis of variance.

Table 37: Analysis of Variance of Means of Risk Propensity among the Groups Classified on the Basis of the Risk Handling Strategies

Source	DF	F	Significance
Cluster	2	.34	.7093

Three observations are important. First, the risk propensity measure should be reexamined. The measure of risk propensity which is more relevant to the industrial purchasing decision must be used to examine the risk handling behavior for the chemical purchasing decision participants. Second, risk propensity might have nothing to do with perceived risk and risk handling strategies. It might be argued that risk propensity is a personality type variable and could not influence and determine the degree of perceived risk and risk handling strategies, both of which are context dependent. Finally, based on the previous argument, there may exist some relationships between perceived risk and risk handling strategies. The groups of respondents classified based on the level of

perceived risk may employ different mixes of risk handling strategies.

Summary

There are some important conclusions on the influences of risk propensity and supplier related mediating factors on the use of risk handling strategies to be made. First, there do not exist differences in risk propensity among the groups classified on the basis of risk handling strategies. Second, the following three groups were identified on the basis of the employment of risk handling strategies: Group I as "Undifferentiated User" group, Group II as "Internal Uncertainty Reduction Strategies User" group, and Group III "External Uncertainty Reduction Strategies User" group. The powerful discriminators among three classified groups were both involvement constructs and source loyalty.

Conclusions

This chapter presented the results of testing the proposed hypotheses which were derived from the conceptual model of risk propensity and the risk handling process for the industrial purchasing professionals. There can be made some important conclusions with respect to the interrelationships between constructs proposed in the model. Overall, most of the proposed hypotheses which were

related to risk propensity were disconfirmed. The reminder of the hypotheses were confirmed.

With respect to the determinant of risk propensity, most of the proposed determinants of risk propensity showed insignificant relationships with risk propensity. Only the variable of the number of years purchasing experience revealed a significant relationship with risk propensity. However, the relationship was still weak. It might conceivably be that the results here might be true only for this sample of chemical industrial buyers. It is noteworthy that several studies reporting contradictory results used different samples. Most of the studies utilizing Kogan and Wallach's measure of risk propensity used college students. Thus a comparison of the results of the present research with the results of previous research is necessarily of limited value. The minimal number of significant results might be due to the different measure of risk propensity, as well. Previous studies reporting contradictory results on correlates of risk propensity employed a variety of risk propensity measures. Differences in measures of risk propensity might lead to different results on correlates of risk propensity. The reported lack of convergent validity among risk propensity measures may substantiate that different measures of risk propensity might result in different results. Also, more

research is needed to determine if the measure of risk propensity was valid and reliable.

The results of canonical correlation analyses provide a different perspective on the measure of risk propensity. Importantly, the underlying assumption of canonical correlation analyses was that each item in the risk propensity measure deals with different dimensions of risk propensity. In this respect, the use of an overall score across 10 items as a criterion of risk propensity might be meaningless. Although the overall measure of risk propensity appeared to have no bearing on most of the factors influencing risk propensity, composites of such items as Question #1, Question #5, Question #8, and Question #9 showed significant relationships with age, education, and income. Therefore, given these independent variables, Question #1, Question #5, Question #8, and Question #9 might be a set of items which can better discriminate risk propensity among chemical purchasing professionals.

As far as the effects of risk propensity on risk handling processes are concerned, the association of risk propensity with the process of risk handling seemed to be statistically insignificant. First, the effect of risk propensity on perceived risk proved to be insignificant. Buyers' attitudes toward risk at the personal level appeared to have no impact upon perceived risk at the level

of organization in the chemical buying situation. Second, there were no significant differences in risk propensity among the groups classified on the basis of risk handling strategies. Again, buyers' attitudes toward risk at the personal level might have no effect upon the use of strategies the chemical purchasing professionals adopt to handle risks. Finally, a buyer's risk, which may be referred to as risk propensity, seemed to be clearly differentiated from organizational risk which may be referred to as perceived risk in the purchasing situation.

The chemical purchasing decision participants seemed to employ the following risk handling strategies: (1) strategies related to seeking information, (2) strategies related to depending upon past experience, and (3) strategies related to premeditation before decision making. These groups of strategies can be interpreted with respect to the uncertainty and consequence dimension of perceived risk. The first group of strategies can be labeled as "external uncertainty reduction strategies." Most of the first group of strategies require the industrial buyer to go outside of his own organization in order to reduce the uncertainty in the buying situation. By contrast, the strategies involved in the second group are related to the internal uncertainty reduction. The industrial buyer tended to reduce the uncertainty perceived in the buying situation by preferring previous suppliers with whom they

were familiar. The third group of strategies were closely related to consequence reduction. The industrial buyers were trying to reduce negative consequences by taking action either within their own firms or outside of their own organization. Internally, such strategies as "Make decisions after a greater deliberation," and "Consult with top management before making decisions" were employed to reduce negative consequences. Externally, the respondents used "Seek top management commitment from supplying company," and "Negotiate with potential suppliers for a better price" to reduce negative consequences.

The risk handling strategies related to "seeking information" were the most typical strategies employed by chemical purchasing professionals. By contrast, the risk handling strategies related to "premeditation before decision making" were the least typical. As expected, being loyal to the existing suppliers was still widely employed by the chemical purchasing professionals.

With respect to the employment of these risk handling strategies, the chemical purchasing decision participants were classified into one of the following clusters: Group I as the undifferentiated user group, Group II as a group who heavily employed risk handling strategies related to relying on past experiences, Group III as a group who heavily employed risk handling strategies related to information seeking.

Among the supplier related factors which mediate the process of risk handling, both dimensions of involvement (personal involvement and company involvement) and source loyalty revealed a set of better discriminators among those groups classified based on the employment of risk handling strategies.

It is noteworthy that the significant discriminators (source loyalty and involvement) are quite different from the insignificant discriminators (source credibility and perceived image) in nature. Interestingly enough, the latter type of variables are related to the evaluation of the supplier which the respondents selected. On the other hand, the former type of variables have no bearings on the evaluation of the supplier. Once the respondents chose the supplier, they tended to evaluate the supplier in a favorable manner regardless of the risk handling strategies they employ. The buyers' evaluation of the supplier might not have a major impact upon their selection and use of specific risk handling strategies.

Based on the cluster means, Group I (undifferentiated users) indicated the highest degree of personal involvement, company involvement, and source loyalty. Group II (source loyalty heavy users) showed the second highest degree of both personal involvement and source loyalty, and the lowest degree of company involvement. Group III (information seeking heavy users) had the lowest

degree of personal involvement and source loyalty, and the second highest degree of company involvement. Hence, it is clear that source loyalty contributed to the distinction of Group III from Group I and II; both personal involvement and company involvement to the distinction of Group I from Group II and III.

It is noteworthy that there did not exist group differences with respect to perceived image and source credibility. The perceived image of the respondents toward the supplier was quite positive and the degree of source credibility was also very favorable regardless of the characteristics of groups.

In summary, the proposed model would appear to be supported by the data analysis. However, most of the relationships which were related to the construct of risk propensity proved insignificant. Quite possibly, the measurement of risk propensity might invalidate the role of risk propensity in the proposed conceptual framework. Further research should be directed toward investigating the measure of risk propensity.

CHAPTER V

DISCUSSION

This chapter begins with a summary of implications and potential importances of this research for both academicians and practitioners. The limitations of this study are discussed, as well. Current research issues and future research directions are presented in both conceptual and methodological dimensions. This chapter ends with the final conclusions.

Implications of the Study

The results of this study are potentially significant to both academicians and practitioners.

For Academicians

Unlike consumer buying, an organizational dimension is an additional aspect of the industrial purchasing. Organizational determinants play a major role in industrial buying decision processes. Importantly, this research takes the role of organizational dimensions into consideration in two conceptual areas.

First, this research made an extensive effort to differentiate perceived risk and risk propensity in the context of industrial buying. To be viewed either as risk taking or risk averse is one thing; how one perceives a

specific purchasing situation is another. However, the literature review indicates that the construct of perceived risk was confused with the concept of risk propensity. For example, Cunningham (1967) misconceptualized the construct of perceived risk by treating it as a personality variable. In fact, the construct of perceived risk is dependent upon a specific situation whose context determines perceived risk. In the context of industrial buying, perceived risk is dependent upon a specific purchasing situation. As shown in this research, the degree of risk perceived in the industrial buying decision may be determined by how important and uncertain the industrial purchasing professionals perceive each of the supplier selection criteria. A purchasing professional's propensity toward risks might rather be treated as a dimension of personality. Therefore, the construct of perceived risk deals with a different domain from the concept of risk propensity.

By introducing the Kogan and Wallach's Risk Propensity Instrument as a measure of perceived risk, Dowling (1985) was also confused in distinguishing risk propensity from perceived risk. What the Kogan and Wallach Instrument intends to measure is a person's general inclination toward risk, not the degree of risk perceived in a given situation. Hence, as Blaylock (1985) pointed out, risk propensity should be distinguished from risk

perception. Clearly, how the industrial purchasing professionals view a given buying situation in which they perceive a certain amount of risk is quite different from how they view themselves. Undoubtedly, the latter (risk propensity) has a major impact upon the former (perceived risk).

In this respect, the proposed model clarifies the distinction between buyer's personal risk (risk propensity) and organizational risk (perceived risk). There exists no comprehensive research which clarifies the relationship between risk propensity and the risk handling process for organizational buyers. By breaking down risk into perceived risk and risk propensity, this research makes a clear distinction between these two constructs and, is in itself, a major contribution. By establishing the effect of risk propensity on risk perception and risk handling strategies, this research also makes it clear that the process of risk handling is influenced by risk propensity. In essence, this research broadens our perspectives on the constructs of risk propensity and risk handling behavior, and helps to better understand the relationship between these two constructs.

Though the conceptual clarification between risk propensity and perceived risk must be essential for the advancement of theory in the industrial marketing, the role of risk propensity was not supported by the results of this

study. Most of the hypotheses testing which were related to risk propensity showed insignificant relationships with risk propensity. Here, questions such as the following are to be raised. Is the role of risk propensity theoretically sound in the proposed model? Or, is the measurement of risk propensity tapping the construct of risk propensity in a valid manner?

More possibly, the minimal number of significant results might be due to the measurement of risk propensity. First of all, the question should be addressed as to the appropriate way of measuring risk propensity. Traditionally, an overall average score over the items in the Kogan and Wallach's Instrument has been used as the indicator of risk propensity. Is the overall average score tapping the construct of risk propensity in a valid manner? The wide variation across different items within the same individual might indicate that each item in the measure deals with different situations even though the measure is supposed to measure one construct, risk propensity. In this respect, the overall average score across items in the risk propensity measure might not be a valid index of risk propensity. The insufficient reliability coefficient for the measure of risk propensity may indicate a wide variation of item scores. The summation of the item scores might diminish the internal consistency of the risk propensity measure. For the same reason, Newton (1976)

treated the individual items in the Kogan and Wallach's measure as having unique dimensions of risk. Additionally, based on the results from the canonical correlation analyses, some significant relationships between various independent variables influencing risk propensity and some items in the risk propensity might be another evidence of the inappropriateness of the traditional way of measuring risk propensity. In sum, the traditionally accepted way of measuring risk propensity might possibly invalidate the role of risk propensity in the proposed conceptual framework.

The introduction of the role of involvement to the industrial buying decision provides an additional insight into the organizational buying process. By breaking down the dimension of involvement into personal involvement and organizational involvement, this study deals with a unique characteristic of the organizational buying process. Quite importantly, both dimensions of involvement turned out to be powerful predictors of the risk handling strategies. Higher personal involvement resulted in the heavy employment of strategies related to the internal uncertainty reduction such as being loyal to the previous suppliers. The chemical purchasing professionals tended to stick to the previous suppliers or the suppliers with whom they were familiar when they perceived the purchasing decision personally critically. On the other hand, higher

company involvement led to the heavy use of strategies related to external uncertainty reduction such as seeking additional information. When the purchasing professionals perceive the buying decision critical to the company, they tended to look for dependable outside information. Therefore, the differentiated roles of both involvement dimensions should provide industrial marketing researchers with potential research opportunity regarding the impact of involvement upon the industrial buying process. As with consumer research, the role of involvement in the industrial purchasing seems to be quite promising as pioneered in this research.

The significant effect of perceived risk upon the risk handling strategies provides a theoretical validation on the relationship between the decision frame of a decision maker and the decision making style. As Kahneman and Tversky (1981) suggested, a decision process may be affected by a decision frame such as perception of the decision. In this study, the groups classified on the basis of the risk handling strategies were significantly differentiated with respect to the dimensions of perceived risk: importance and uncertainty. With the importance dimension, those who employed risk handling strategies in an undifferentiated manner perceived the supplier selection criteria as more important. Higher perceived importance on the supplier selection criteria might activate the

employment of a variety of risk handling strategies. With the uncertainty dimension, the group who were very uncertain about the supplier selection criteria heavily depended upon external sources to reduce uncertainty. It is obvious from this study that external information sources were mainly used to reduce uncertainty in the purchasing situation. The significant differences among the groups with regard to the both dimensions of perceived risk imply that perceived risk has a significant impact upon the strategies the purchasing professionals adopt to cope with risk. Consequently, the effect of a decision maker's decision frame such as perception of the decision problem upon the decision making style was confirmed to some extent in this research.

The proposed model itself makes some contributions to theory development and advancement in the area of industrial marketing. By integrating (1) risk propensity, (2) factors affecting risk propensity, (3) the risk handling process, and (4) factors mediating the risk handling process, the proposed model serves as a framework to guide future research related to risk in the area of industrial buying. Additionally, in the perspective of risk handling, the proposed model provides the comprehensive process of an industrial decision process by introducing five phases of risk handling. Furthermore, the proposed model synthesizes and expands the factors

mediating the risk handling process. Hence, the proposed model should help to further develop new concepts and research methods unique to the industrial case.

Finally, this study helps to facilitate the transfer of theories, concepts, and methods which belong to other disciplines into the domain of industrial marketing. Traditionally, consumer behaviorists pioneered exploring the construct of consumer's perceived risk and the effect of perceived risk on the consumer's decision process. Such information may prove equally valuable for industrial marketers in analyzing their markets. Basically, industrial market researchers have made an effort to borrow theories, concepts, and research methods from other disciplines, such as consumer science and communication, and apply them for the sample of industrial purchasing professionals. By implanting the concept of perceived risk and risk handling behavior pioneered in the consumer research into the ground of industrial markets, this study should play an important role in expanding the realm of research in the industrial marketing.

For Practitioners

A high degree of source loyalty was found among the respondents. Source loyalty was also very influential on the choice of strategies the purchasing professionals adopt. The findings from this study concerning buyers'

risk handling strategies and the importance of past experience in their supplier selection decisions point to the need for the chemical suppliers to build up buyers' confidence in their ability to provide the required level of service. In the case of an established supplier, knowledge of the factors which strengthen source loyalty enables the supplier to stress them in its strategy; in the case of new suppliers, source loyalty provides an indication to the potential supplier of the approach required to overcome buyer resistance to the placement of an order with a new supplier.

To strength source loyalty, it seems obvious from this study that the supplier should aim at not only economic factors such as cost and quality of material but non-economic factors such as ability to deliver on time, service, company ethics of the supplier, dependability of promises made, and capability of supplying future demand. These non-economic forces were perceived as important as cost and quality of material. Even where buyers selected the supplier offering lower price and better quality, these non-economic factors strengthen source loyalty and cause the buyer to patronize the supplier.

Industrial marketers could also achieve higher source loyalty by reducing uncertainty on the supplier selection criteria about which the chemical buyers were more uncertain. The results of this research indicate that the

respondents felt more uncertain on the following factors: production facilities, financial status of the supplier, innovative nature of the supplier, packaging capability, attitude toward buyer, and effectiveness of the salesperson.

In essence, source loyalty could be strong not only improving the factors the buyer perceived important in making the purchase decision, but also focusing on the criteria on which the buyer felt uncertain.

Surprisingly, the constructs related to the evaluation of the supplier such as perceived image and source credibility turned out to be weak discriminators among the groups classified on the basis of the use of risk handling strategies. On the other hand, involvement and source loyalty proved to be strong discriminators. It seems that how the buyer evaluates the supplier has no bearing on the way the supplier handles risk in the purchasing situation.

As Sheth (1977) pointed out, research on supplier choices is fascinating and highly useful for marketing policy purposes. Undoubtedly, there were many studies exploring the vendor selection process in different perspectives. However, there exists no previous examples which examine the supplier selection process in the perspective of risk handling. The view of the supplier selection process as risk handling provides marketing

practitioners with a useful tool in understanding buyers perceived risk and risk handling strategies.

It is noteworthy from this study that the strategies adopted by the respondents could be classified on the dimensions of perceived risk. The chemical purchasing professionals sought for external sources of additional information. At the same time, they tended to be loyal to the supplier with whom they were familiar as a means of reducing uncertainty. They were also actively involved in consulting with either their top management or suppliers' top management to seek commitment. They might have wanted to avoid negative consequences before making decisions. Knowledge of these risk handling strategies can be very useful for industrial marketers to improve the effectiveness of marketing decisions and to understand the needs of the buying organization. Both "in-suppliers (established suppliers)" and "out-suppliers (new suppliers)" can influence the drafting of the product specifications in favor of the supplier's company, once both suppliers understand how the buyers handle the purchasing process.

Thorough understanding of the supplier related factors mediating the risk handling process in the proposed model enables suppliers to improve their communication with buyers. The potential of suppliers communication depends on the their degree of understanding the supplier related

variables which mediate this risk handling process. The understanding of these factors is also useful in market selection and marketing management. Involvement and source loyalty were found to be influential in industrial buying decisions. For industrial marketers, these supplier related factors may serve as a basis to choose market segments. Consequently, the understanding of those market segmentation bases helps to facilitate the development of strategies, plans, and programs to meet profitably the needs of selected segments.

For the purpose of market segmentation, the respondents can be segmented on the basis of the importance they assigned to each of the supplier selection criteria. The chemical market can be segmented on the basis of the following criteria which the respondents ranked highly in this study: quality of material, ability to deliver on schedule, dependability of promises made, capability of supplying future demand, cost of material, and service. These criteria should serve a useful basis for benefit segmentation strategy in the chemical industry.

In conclusion, this research provides useful guidelines to manage and monitor vendors for manufactures and industrial buyers. As Garvin (1984) suggested, careful selection and monitoring of vendors is a necessary first step toward ensuring reliable and defect-free production. By examining and understanding "inside" variables related

to buyer, this study can help manufactures and industrial buyers to better select and control vendors.

Limitations of the Study

This study deals with single-decision-participants. Often times, a buying center within an organization consists of multiple decision participants. The members in the buying center may have varying perspectives on the purchase and may exhibit quite different types of buying behavior. However, the mutual interaction among the decision participants in the buying center was not considered for this research. This research deals with only the purchasing professionals as units of analysis.

Similarly, the scope of research is limited to one type of situation: modified rebuy. The results of this research may not be applicable to other types of purchasing situations such as straight rebuy and new task. These other types of purchasing situations may show different types of risk handling process. Likewise, this study was confined to the one type of industry, the chemical industry. It is possible that the results of this research may not be generalizable across other industries.

Questions about the sampling method for this study might be raised in terms of validity. The use of membership lists of Purchasing Association might possibly limit the statistical validity of the results. Similarly,

the usefulness of the membership roster might be questioned because this membership roster did not provide any information on non-members. There may be possible differences between members and non-members with respect to the research variables.

The variables excluded from the research variables proposed in the model might affect the results. For example, the social influence of risk propensity might affect the results regarding the determinants of risk propensity. The weak power in the regression analysis might indicate the important addition of non-research variables to this research. Likewise, the role of buyer-seller similarity might have a crucial impact on perceived risk and the employment of risk handling strategies.

Finally, the constructs of risk propensity and perceived risk might be confounded. It might be possible that there could be certain problems with differentiating perceived risk and risk propensity, either conceptually or methodologically. Further research is needed to determine if the construct of perceived risk could be distinguished from that of risk propensity.

Needs for Future Research

Conceptual Dimension

First, the results of this research indicate that the conceptual model of risk propensity and its relationship to the risk handling process for industrial purchasing professionals should be reexamined. The role of risk propensity appears quite ambiguous. The influence of risk propensity on both perceived risk and the risk handling strategies needs to be explored in the further research.

Additionally, researchers need to investigate the style of risk taking for the industrial purchasing professionals. The focus of this research was on the degree of risk taking: what is their risk propensity? However, the question of how they responded to the risky scenarios deserve attention. In this regard, the classification of risk takers into cognitive risk takers and motivational risk takers may serve a conceptual framework. More exploratory research is needed. As Kogan and Wallach (1964) asserted, the cognitive risk takers do not follow a consistent pattern, but look for situational cues which indicate how much risk to take. By contrast, the motivational risk takers are controlled by inner motivations such as defensiveness. This type of risk taker reflects consistent risk attitudes: i.e., either

consistently risk taking or consistently risk averse or consistently risk neutral.

This distinction between the two styles of risk taking has an important strategic implication. If chemical purchasing professionals are classified into cognitive risk takers, they tend to evaluate each of the individual purchasing situations and respond in a different manner to each purchasing situation. They tend to be flexible in their risk attitudes and analyze each situation on its own merits. Hence, their risk handling process may be considered as rational and at the same time their purchasing strategy appears to be quite efficient. The reverse is true for the motivational risk takers. The classification of the purchasing decision participants into either motivational or cognitive risk takers depends on their response patterns on the measure of risk propensity. In essence, identifying the style of risk taking for purchasing professionals should be useful in managing and monitoring their purchasing strategies.

A number of studies have characterized the organizational buyers as risk averse. This is hardly surprising as the rewards for risk taking behavior in buying are difficult to measure; the negative consequences, however, are only too visible. Importantly, the results from this research do not appear to be consistent with those previous studies. Given the measure of risk

propensity used in this study, the risk propensity for chemical purchasing professionals was quite dependent upon the situation. These contradictory results may result from the loose definition of risk in the previous risk-related research. If previous researchers considered risk in the organizational dimension, industrial buyers might be viewed as risk averse. If they considered risk in terms of personal risk, the risk propensity for industrial purchasing professionals would be situationally variant. In this respect, further research should be focused on attempts to develop a better taxonomy for risk related constructs in industrial markets. The ideal taxonomy should make better distinctions between "perceived risk," "risk propensity," "personal risk," and "organizational risk."

As Blaylock (1985) cogently suggested, the distinction between the actual amount of risk, perceived risk, and risk attitude should be made. By exploring the effect of the actual amount of risk on perceived risk, and by examining the relationship between risk attitude and the actual amount of risk, future research should establish the mutual relationships between these three "basic" concepts of risk in the industrial purchasing setting.

Additionally, efforts should be made to replicate this research among other types of industries and other types of buying situations. Future research needs to

explore perceived risk and risk handling strategies in a different type of industry and in a different type of buying situation. For example, the investigation of "new task" type buying situation may reveal more variations of perceived risk with different risk handling strategies.

Several topics on consumer information processing may be applied to the area of industrial risk research. For example, since mood, or organizational environments may affect managers' perceived risk, it may be interesting to examine the effect of mood on perceived risk. If performance is influenced by perceived risk, the strategic mechanism to improve organizational environments should be devised to enhance the performance level. Another example would be an investigation of the effect of industrial buyers' "decision frames" on performance. Since a decision maker's perception of the decision problem is a major determinant of decision frame, perceived risk is also expected to influence performance.

Finally, as a group of people in the buying center interact with each other during the industrial buying decision making, variables related to communication deserve examination. The effects on the vendor selection process of the variables like communication network, group risk shifty phenomenon, power structure, and roles should be examined in the future research. For this research, the research sample should include those decision participants

from different functional areas, from different organizational levels, and with very different personal backgrounds to obtain different perspectives.

Methodological Dimension

An important research priority is to develop an efficient and effective methodology for collecting data on the complex industrial decision process to close the gap between theory and practice. Sheth (1977), in his review of organizational buyer behavior, concluded that a significant amount of both theoretical and empirical work within the industrial buying behavior area seems to have had limited impact on marketing thought or practice. Similarly, Moriarty (1983) pointed out, the major reason for the gap between theories of organizational buying behavior and the practice of industrial marketing is the difficulty of obtaining reliable data. It appears that the lack of an efficient methodology for collecting behavioral data on complex industrial purchasing decision processes has hindered the development of theories in industrial marketing.

Mail questionnaires are a low-cost method of collecting detailed data from a large sample of people; however, these questionnaires have been used primarily for single-respondent research that focused on the purchasing professionals, ignoring the basic concept of a

multiple-person buying center. Obtaining the viewpoints of multiple decision participants is essential in conducting research on organizational buying behavior. Often times, a snowballing technique has been suggested as a alternative to mail surveys. However, this snow balling technique still has some problems of identifying the primary respondents (Moriarty 1983). A more refined form of data-collection strategy should be developed to investigate industrial buying behavior in the industrial markets.

The measure of risk propensity needs to be developed for a group of industrial purchasing professionals. Regarding the measure of risk propensity used in this study, the validity of this measure might appear to be questionable. Even though the validity and reliability of this risk propensity measure have been reported in studies since 1964, the adequacy of this measure for the particular sample of industrial purchasing professionals is questionable and also raised questions about previous studies. Hence, research should be directed toward developing more relevant measures of risk propensity which can tap the construct of risk propensity. The refined form of risk propensity measure may or may not consist of a set of items from the original Kogan and Wallach's Choice Dilemma Instrument. Methodologically, modern psychometric theory such as item response theory may be efficiently employed to obtain this set of items via item and test

information functions. Factor analytical methods might also be added to this procedure. Or, a new instrument to measure risk propensity for industrial purchasing professionals should be explored. In essence, whatever the form of the risk propensity measure, it should be a valid and reliable measure of risk propensity for this particular group and others.

The measurement of perceived risk is another methodological issue for future research. Such research should compare advantages and disadvantages of the following three alternate measures of perceived risk: the multiplicative measure, the additive measure, and the uncertainty dimension only measure. Besides these measures, a new methodological approach may be taken in an effort to develop more proper measures of perceived risk.

Conclusions

This study was quite exploratory in nature. Findings from this research would appear to support the proposed conceptual framework. However, most of the conceptual interrelationships which were related to risk propensity were disconfirmed. Some possible explanations for this results were suggested.

For academicians, the conceptual model of risk propensity and the risk handling process for industrial purchasing should be a foundation guiding future research

on risk in industrial marketing. From a practical viewpoint, the results of this study can serve as a basis to improve industrial buying decision processes for both industrial marketers and industrial buyers.

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APPENDICES

APPENDIX A
INTRODUCTION LETTER

**National
Association of
Purchasing
Management**



CHEMICAL GROUP

NATIONAL CHAIRMAN
Gary Corson
Tennessee Eastman Company
P.O. Box 511
Kingsport, TN 37662
615-229-3320

February 25, 1988

Dear Chemical Group Member:

The Graduate Business School, University of Tennessee, Knoxville, in cooperation with the National Association of Purchasing Management (N.A.P.M.), is conducting a nationwide research project involving purchasing professionals.

The primary purpose of this study is to better understand and improve the purchase decision process of the chemical purchasing professional like yourself.

We strongly believe careful selection and monitoring of suppliers in the chemical industry is a necessary first step toward ensuring reliable and defect-free production. The results of this research should provide you with valuable information about how to select suppliers and how to manage them.

You, as an important and essential contributor to this study, will receive a mail questionnaire from the Graduate Business School, University of Tennessee, Knoxville, within a week.

We urge you to complete and return the questionnaire as soon as possible. It is imperative to obtain your completed questionnaire for the success of this research. Again, your reply is extremely important to the Chemical Group and your profession.

Thank you very much for supporting this important research project.

Sincerely yours,

Gary Corson
National Chairman

jmd

First Vice-Chairman
Robert W. Johnson
Hercules Inc.
Hercules Plaza
Wilmington, DE 19894
302-594-7167

Second Vice-Chairman
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Birmingham, AL 35253
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APPENDIX B
COVER LETTER AND QUESTIONNAIRE

THE UNIVERSITY OF TENNESSEE
KNOXVILLE

March 3, 1988



Mr. Robert w. Liebau
Chem-Pro Corporation
P. O. Box 1248
Fairfield, NJ 07007

Dear Mr. Liebau:

College of
Business
Administration

Office of Graduate
Business Programs

At the University of Tennessee, we are conducting a national research project aimed at better understanding the decision-making process of purchasing professionals like yourself. And, we need your help! Careful selection and monitoring of suppliers in the chemical industry is a necessary first step toward ensuring reliable and defect-free production. The results of this research should provide you with valuable information about how to select suppliers and how to manage them.

Mr. Gary Corson, President of the Chemical Division of the National Association of Purchasing Managers, wrote to you last week about this major research undertaking and pointed out that your participation is absolutely critical to the success of the project. We know that you get many requests to complete questionnaires, but sincerely hope you will realize the importance of participating in this study. The research will make significant contributions to your profession, I believe.

Please complete the questionnaire by March 15 and return it to us in the self-addressed, postage paid envelope as soon as possible. And remember, the success of the entire project depends upon your participation. We hope we can count on you.

The results of this research will be made available to N.A.P.M. and all participants. If you would like a summary of the results, please write your name and address on the back of the questionnaire, or if you would prefer, on the back of the return envelope. I would be most happy to answer any questions you might have. Please call or write. The telephone number is 615-974-5033.

Thanks so very much for your help.

Sincerely,

A handwritten signature in dark ink, appearing to read "Roger L. Jenkins".

Roger L. Jenkins, Ph.D.
President, Academy of Marketing Science
Professor of Marketing
Associate Dean for Graduate Business Programs

A handwritten signature in dark ink, appearing to read "J. P. Noh".

J. P. Noh
Marketing Doctoral Student

STUDY OF INDUSTRIAL PURCHASING DECISION-MAKING

Instructions

The purpose of this study is to better understand how you make purchase decisions for materials.

The questionnaire has four parts. Please answer all of the questions and complete each part in order. There are no "right" or "wrong" answers. Just select the response that best describes the way you feel. Your answers will remain strictly confidential.

A list of key terms and their definitions used in the questionnaire appears below. These will help you interpret some of the questions.

We hope that you will promptly complete the questionnaire and return it in the envelope provided. Return postage is already included. Thank you for your time and cooperation. The success of the research project depends on your help.

Definitions

- | | |
|-------------------------------|--|
| The Supplier: | the company supplying raw materials for your company. |
| The Materials: | the raw chemical materials for your company. |
| The Previous Supplier: | the supplier you have used more often in the past or the one with whom you are most familiar. The previous supplier might or might not be the supplier you selected in responding to this questionnaire. |

PART I

In answering the questions in this part, please think back over the past 12 months about how you make decisions when you purchase materials. For responding to the questions below, **RECALL THE LAST DECISION IN WHICH AT LEAST TWO COMPETITIVE SUPPLIERS WERE INVOLVED.** The supplier you selected might or might not be the previous supplier you used. (In PART I, circle the appropriate number for your answer.)

1. Was the supplier you selected the previous supplier?

1 YES
2 NO

2. For this particular decision, how would you characterize your loyalty to the previous supplier?

VERY LOYAL 1 2 3 4 5 6 7 NOT LOYAL

3. Overall, how critical to your company was this purchase decision?

VERY CRITICAL 1 2 3 4 5 6 7 NOT CRITICAL

4. Overall, how critical to you personally was this purchase decision?

VERY CRITICAL 1 2 3 4 5 6 7 NOT CRITICAL

5. How would you describe the supplier you selected?

UNTRUSTWORTHY	1	2	3	4	5	6	7	TRUSTWORTHY
EXPERT	1	2	3	4	5	6	7	NON-EXPERT
FAMILIAR	1	2	3	4	5	6	7	UNFAMILIAR
NOT CREDIBLE	1	2	3	4	5	6	7	CREDIBLE
POSITIVE IMAGE	1	2	3	4	5	6	7	NEGATIVE IMAGE
UNPROFESSIONAL	1	2	3	4	5	6	7	PROFESSIONAL

PART II

1. Please keep in mind the same material purchase decision you selected in responding to PART I. The purchase decision you selected must be the last decision in which at least two competitive suppliers were involved.

Please indicate below how important or unimportant the specific criteria were to you in making the purchase decision. For example, if "Performance history" of the supplier was not important to you in making the purchasing decision, then you would circle 5 for "NOT IMPORTANT".

Also, please indicate below how certain or uncertain you felt about each criterion during the decision-making process. For example, if you felt totally confident about your knowledge of the "Performance history" of the supplier, then you would circle 1 for "VERY CERTAIN".

	VERY IMPORTANT					NOT IMPORTANT					VERY CERTAIN					VERY UNCERTAIN				
<i>EXAMPLE: Performance history</i>	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Cost of material	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Confidence in the salesperson	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Ability to deliver on schedule	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Service	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Technical capability	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Production facilities	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Overall reputation	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Dependability of the salesperson	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Quality of material	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Bidding compliance	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Financial status of the supplier	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Innovative nature	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Geographic location for shipping	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Company ethics of the supplier	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Packaging capability	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Attitude toward buyer	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Effectiveness of the salesperson	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Dependability of promises made	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Capability of supplying future demand	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5

2. Every purchasing decision entails risks. How much did you rely on each of the following risk reduction (or handling) strategies when you chose the particular supplier in responding to the previous sections? Again, please remember that the purchase decision must be the last decision in which at least two competitive suppliers were involved. (Circle the appropriate number for your answer.)

	<u>VERY MUCH</u>				<u>NOT AT ALL</u>
Consult with top management before making decisions.	1	2	3	4	5
Search for additional published information.	1	2	3	4	5
Negotiate with potential suppliers for a better price.	1	2	3	4	5
Prefer well-known suppliers with good reputations.	1	2	3	4	5
Consult with buyers in other firms about their experience with potential suppliers.	1	2	3	4	5
Arrange for visits to potential suppliers.	1	2	3	4	5
Negotiate a penalty clause in the contract.	1	2	3	4	5
Prefer previous suppliers with whom you are familiar.	1	2	3	4	5
Consult with experts for their opinion.	1	2	3	4	5
Split the order among potential suppliers.	1	2	3	4	5
Seek top management commitment from supplying company.	1	2	3	4	5
Make decisions after a greater deliberation.	1	2	3	4	5
Consult with manufacturing people about rescheduling production.	1	2	3	4	5
Select relatively nearby suppliers.	1	2	3	4	5
Rely on past experiences.	1	2	3	4	5

PART III

Instructions: The central person in each of the following situations is faced with a choice between two alternative courses of action, which we might call X and Y.

Alternative X is more desirable and attractive than alternative Y, but the probability of attaining or achieving X is less than that of attaining or achieving Y.

For each situation on the following, you will be asked to indicate the minimum odds of success you would demand before recommending that the more attractive or desirable alternative, X, be chosen.

Read each situation carefully before giving your judgment. Try to place yourself in the position of the central person in each of the situations. There are twelve situations in all. Please do not omit any of them.

1. Mr. A, an electrical engineer, who is married and has one child, has been working for a large electronics corporation since graduating from college five years ago. He is assured of a lifetime job with a modest, though adequate, salary, and liberal pension benefits upon retirement. On the other hand, it is very unlikely that his salary will increase much before he retires. While attending a convention, Mr. A is offered a job with a small, newly founded company which has a highly uncertain future. The new job would pay more to start and would offer the possibility of a share in the ownership if the company survived the competition of the larger firms.

Imagine that you are advising Mr. A. Listed below are several probabilities or odds of the new company's proving financially sound.

Please check the lowest probability that you would consider acceptable to make it worthwhile for Mr. A to take the new job.

- ☐ The chances are 1 in 10 that the company will prove financially sound.
- ☐ The chances are 3 in 10 that the company will prove financially sound.
- ☐ The chances are 5 in 10 that the company will prove financially sound.
- ☐ The chances are 7 in 10 that the company will prove financially sound.
- ☐ The chances are 9 in 10 that the company will prove financially sound.
- ☐ Place a check here if you think Mr. A should not take the new job no matter what the probabilities.

2. Mr. B, a married man with two children, has a steady job that pays him about \$35,000 per year. He can easily afford the necessities of life, but few of the luxuries. Mr. B's father, who died recently, carried a \$30,000 life insurance policy. Mr. B would like to invest this money in stocks. He is well aware of the secure "blue-chip" stocks and bonds that would pay approximately 6% on his investment. On the other hand, Mr. B has heard that the stocks of a relatively unknown Company X might double their present value if a new product currently in production is favorably received by the buying public. However, if the product is unfavorably received, the stocks would decline in value.

Imagine that you are advising Mr. B. Listed below are several probabilities or odds that Company X stocks will double their value.

Please check the lowest probability that you would consider acceptable for Mr. B to invest in Company X Stocks.

- ☐ Place a check here if you think Mr. B should not invest in Company X stocks, no matter what the probabilities.
- ☐ The chances are 9 in 10 that the stocks will double their value.
- ☐ The chances are 7 in 10 that the stocks will double their value.
- ☐ The chances are 5 in 10 that the stocks will double their value.
- ☐ The chances are 3 in 10 that the stocks will double their value.
- ☐ The chances are 1 in 10 that the stocks will double their value.

3. Mr. C, a 45-year-old accountant, has recently been informed by his physician that he has developed a severe heart ailment. The disease would be sufficiently serious to force Mr. C to change many of his strongest life habits -- reducing his work load, drastically changing his diet, giving up favorite leisure-time pursuits. The physician suggests that a delicate medical operation could be attempted which, if successful, would completely relieve the heart condition. But its success could not be assured, and in fact, the operation might prove fatal.

Imagine that you are advising Mr. C. Listed below are several probabilities or odds that the operation will prove successful.

Please check the lowest probability that you would consider acceptable for the operation to be performed.

- ☐ The chances are 1 in 10 that the operation will be a success.
- ☐ The chances are 3 in 10 that the operation will be a success
- ☐ The chances are 5 in 10 that the operation will be a success.
- ☐ The chances are 7 in 10 that the operation will be a success.
- ☐ The chances are 9 in 10 that the operation will be a success.
- ☐ Place a check here if you think Mr. C should not have the operation no matter what the probabilities.

4. Mr. D is an American captured by the enemy in the Vietnam War and placed in a prisoner-of-war camp. Conditions in the camp are quite bad, with long hours of hard physical labor and a barely sufficient diet. After spending several months in this camp, Mr. D notes the possibility of escape by concealing himself in a supply truck that shuttles in and out of the camp. Of course, there is no guarantee that the escape would prove successful. Recapture by the enemy could well mean execution.

Imagine that you are advising Mr. D. Listed below are several probabilities or odds of a successful escape from the prisoner-of-war camp.

Please check the lowest probability that you would consider acceptable for an escape to be attempted.

- ☐ Place a check here if you think Mr. D should not try to escape no matter what the probabilities.
- ☐ The chances are 9 in 10 that the escape would succeed.
- ☐ The chances are 7 in 10 that the escape would succeed.
- ☐ The chances are 5 in 10 that the escape would succeed.
- ☐ The chances are 3 in 10 that the escape would succeed.
- ☐ The chances are 1 in 10 that the escape would succeed..

5. Mr. E is the captain of College X's football team. College X is playing its traditional rival, College Y, in the final game of the season. The game is in its final seconds, and Mr. E's team, College X, is behind in the score. College X has time to run one more play. Mr. E, the captain, must decide whether it would be best to settle for a tie score with a play which would be almost certain to work or, on the other hand, should he try a more complicated and risky play which could bring victory if it succeeded, but defeat if not.

Imagine that you are advising Mr. E. Listed below are several probabilities or odds that the risky play will work.

Please check the lowest probability that you would consider acceptable for the risky play to be attempted.

- ☐ The chances are 1 in 10 that the risky play will work,
- ☐ The chances are 3 in 10 that the risky play will work,
- ☐ The chances are 5 in 10 that the risky play will work,
- ☐ The chances are 7 in 10 that the risky play will work,
- ☐ The chances are 9 in 10 that the risky play will work,
- ☐ Place a check here if you think Mr. E should not attempt the risky play no matter what the probabilities.

6. Mr. F is president of a light metals corporation in the United States. The corporation is quite prosperous, and has strongly considered the possibilities of business expansion by building an additional plant in a new location. The choice is between building another plant in the U.S., where there would be a moderate return on the initial investment, or building a plant in a foreign country. Lower labor cost and easy access to raw materials in that country would mean a much higher return on the initial investment. On the other hand, there is a history of political instability and revolution in the foreign country under consideration. In fact, the leader of a small minority party is committed to nationalizing, that is, taking over, all foreign investments.

Imagine that you are advising Mr. F. Listed below are several probabilities or odds of continued political stability in the foreign country under consideration.

Please check the lowest probability that you would consider acceptable for Mr. F's corporation to build a plant in that country.

- ☐ Place a check here if you think Mr. F's corporation should not build a plant in the foreign country, no matter what the probabilities.
- ☐ The chances are 9 in 10 that the foreign country will remain politically stable.
- ☐ The chances are 7 in 10 that the foreign country will remain politically stable.
- ☐ The chances are 5 in 10 that the foreign country will remain politically stable.
- ☐ The chances are 3 in 10 that the foreign country will remain politically stable.
- ☐ The chances are 1 in 10 that the foreign country will remain politically stable.

7. Mr. G is currently a college senior who is very eager to pursue graduate study in chemistry leading to the Doctor of Philosophy degree. He has been accepted by both University X and University Y. University X has a world-wide reputation for excellence in chemistry. While a degree from University X would signify outstanding training in this field, the standards are so very rigorous that only a fraction of the degree candidates actually receive the degree. University Y, on the other hand, has much less of a reputation in chemistry, but almost everyone admitted is awarded the Doctor of Philosophy degree, though the degree has much less prestige than the corresponding degree from University X.

Imagine that you are advising Mr. G. Listed below are several probabilities or odds that Mr. G would be awarded a degree at University X, the one with the greater prestige.

Please check the lowest probability that you would consider acceptable to make it worthwhile for Mr. G to enroll in University X rather than University Y.

- ☐ The chances are 1 in 10 that Mr. G would receive a degree from University X.
- ☐ The chances are 3 in 10 that Mr. G would receive a degree from University X.
- ☐ The chances are 5 in 10 that Mr. G would receive a degree from University X.
- ☐ The chances are 7 in 10 that Mr. G would receive a degree from University X.
- ☐ The chances are 9 in 10 that Mr. G would receive a degree from University X.
- ☐ Place a check here if you think Mr. G should not enroll in University X, no matter what the probabilities.

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

Imagine that you are advising Mr. H. Listed below are several probabilities or odds that Mr. H's deceptive play would succeed.

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

- ☐ Place a check here if you think Mr. H should not attempt the risky play, no matter what the probabilities.
- ☐ The chances are 9 in 10 that the play would succeed.
- ☐ The chances are 7 in 10 that the play would succeed.
- ☐ The chances are 5 in 10 that the play would succeed.
- ☐ The chances are 3 in 10 that the play would succeed.
- ☐ The chances are 1 in 10 that the Play would succeed.

9. Mr. J, a college senior, has studied the piano since childhood. He has won amateur prizes and given small recitals, suggesting that Mr. J has considerable musical talent. As graduation approaches, Mr. J has the choice of going to medical school to become a physician, a profession which would bring certain prestige and financial rewards; or entering a conservatory of music for advanced training with a well-known pianist. Mr. J realizes that even upon completion of his piano studies, which would take many more years and a lot of money, success as a concert pianist would not be assured.

Imagine that you are advising Mr. J. Listed below are several probabilities or odds that Mr. J would succeed as a concert pianist.

Please check the lowest probability that you would consider acceptable for Mr. J to continue with his musical training.

- ☐ The chances are 1 in 10 that Mr. J would succeed as a concert pianist.
- ☐ The chances are 3 in 10 that Mr. J would succeed as a concert pianist.
- ☐ The chances are 5 in 10 that Mr. J would succeed as a concert pianist.
- ☐ The chances are 7 in 10 that Mr. J would succeed as a concert pianist.
- ☐ The chances are 9 in 10 that Mr. J would succeed as a concert pianist.
- ☐ Place a check here if you think Mr. J should not pursue his musical training, no matter what the probabilities.

10. Mr. K, a married 30-year-old research physicist, has been given a five-year appointment by a major university laboratory. As he contemplates the next five years, he realizes that he might work on a difficult, long-term problem which, if a solution could be found, would resolve basic scientific issues in the field and bring high scientific honors. If no solution were found, however, Mr. K would have little to show for his five years in the laboratory, and this would make it hard for him to get a good job afterwards. On the other hand, he could, as most of his professional associates are doing, work on a series of short-term problems where solutions would be easier to find, but where the problems are of lesser scientific importance.

Imagine the you are advising Mr. K. Listed below are several probabilities or odds that a solution would be found to the difficult, long-term problem that Mr. K has in mind.

Please check the lowest probability that you would consider acceptable to make it worthwhile for Mr. K to work on the more difficult long-term problem.

- ☐ Place a check here if you think Mr. K should not choose the long-term, difficult problem, no matter what the probabilities.
- ☐ The chances are 9 in 10 that Mr. K would solve the long-term problem
- ☐ The chances are 7 in 10 that Mr. K would solve the long-term problem.
- ☐ The chances are 5 in 10 that Mr. K would solve the long-term problem.
- ☐ The chances are 3 in 10 that Mr. K would solve the long-term problem.
- ☐ The chances are 1 in 10 that Mr. K would solve the long-term problem.

11. Mr. L is a successful businessman who has participated in a number of civic activities of considerable value to the community. Mr. L has been approached by the leaders of his political party as a possible congressional candidate in the next election. Mr. L's party is a minority party in the district, though the party has won occasional elections in the past. Mr. L would like to hold political office, but to do so would involve a serious financial sacrifice, since the party has insufficient campaign funds. He would also have to endure the attacks of his political opponents in a hot campaign.

Imagine that you are advising Mr. L. Listed below are several probabilities or odds of Mr. L's winning the election in his district.

Please check the lowest probability that you would consider acceptable to make it worthwhile for Mr. L to run for political office.

- ☐ *The chances are 1 in 10 that Mr. L would win the election.*
- ☐ *The chances are 3 in 10 that Mr. L would win the election.*
- ☐ *The chances are 5 in 10 that Mr. L would win the election.*
- ☐ *The chances are 7 in 10 that Mr. L would win the election.*
- ☐ *The chances are 9 in 10 that Mr. L would win the election.*
- ☐ *Place a check here if you think Mr. L should not run for political office no matter what the probabilities.*

12. Mr. M is contemplating marriage to Miss T, a girl whom he has known for a little more than a year. Recently, however, a number of arguments have occurred between them, suggesting some sharp differences of opinion in the way each views certain matters. Indeed, they decide to seek professional advice from a marriage counselor as to whether it would be wise for them to marry. On the basis of these meetings with a marriage counselor, they realize that a happy marriage, while possible, would not be assured.

Imagine that you are advising Mr. M and Miss T. Listed below are several probabilities or odds that their marriage would prove to be a happy and successful one.

Please check the lowest probability that you would consider acceptable for Mr. M and Miss T to get married.

- ☐ *Place a check here if you think Mr. M and Miss T should not marry, no matter what the probabilities.*
- ☐ *The chances are 9 in 10 that the marriage would be happy and successful*
- ☐ *The chances are 7 in 10 that the marriage would be happy and successful*
- ☐ *The chances are 5 in 10 that the marriage would be happy and successful*
- ☐ *The chances are 3 in 10 that the marriage would be happy and successful*
- ☐ *The chances are 1 in 10 that the marriage would be happy and successful*

PART IV

This last section is designed to gather information about you and your company for statistical purposes only. It is very important that you complete this section and please remember all individual responses will be held in strictest confidence. Please check the appropriate category for your answer, or write in the appropriate answer as indicated.

1. During your professional career, how many years have you worked in the purchasing area?
_____ YEARS
2. How many years have you worked in your present position in this company?
_____ YEARS
3. What is your job title? _____
4. In what percentage of your purchasing material decisions do you have final authority?
_____ %
5. Do you have a limit you can approve without further authorization for purchasing materials?
____ NO
____ YES (If yes, what is the dollar limit ? _____ DOLLARS)
6. Are you?
____ MALE
____ FEMALE
7. What is your age?
_____ YEARS
8. What is the highest level of education that you have obtained?
____ SOME HIGH SCHOOL WORK
____ HIGH SCHOOL GRADUATION
____ AT LEAST TWO YEARS OF COLLEGE
____ BACHELOR'S DEGREE
____ AT LEAST ONE FULL YEAR OF GRADUATE WORK
____ MASTER'S DEGREE
____ DOCTORAL DEGREE

9. Which of the following categories includes the number of employees in your company?

- ☐ LESS THAN 100
- ☐ 101 TO 250
- ☐ 251 TO 500
- ☐ 501 TO 750
- ☐ 751 TO 1,000
- ☐ MORE THAN 1,000

10. Which of the following categories best describes your 1987 **before tax** earned income?

- | | |
|---|---|
| ☐ UNDER \$20,000 | ☐ \$50,000 TO \$59,999 |
| ☐ \$20,000 TO \$29,999 | ☐ \$60,000 TO \$69,999 |
| ☐ \$30,000 TO \$39,999 | ☐ \$70,000 TO \$79,999 |
| ☐ \$40,000 TO \$49,999 | ☐ \$80,000 OR OVER |

Your contribution to this study is greatly appreciated. If you would like a summary of results, please print your name and address below.

NAME _____

ADDRESS _____

CITY _____

STATE _____ ZIP _____

APPENDIX C

REMINDING LETTER

THE UNIVERSITY OF TENNESSEE
KNOXVILLE



College of
Business
Administration

Office of Graduate
Business Programs

March 14, 1988

Dear Purchasing Professional:

Last week, we mailed to you a questionnaire asking for your opinion about how you make purchase decisions for materials.

If you have already completed and returned it to us, please accept our sincere thanks. If not, could I ask you to please do so today? It is extremely important that your response be included in the study if the results are to accurately represent the opinions of purchasing professionals.

In cooperation with the National Association of Purchasing Management (N.A.P.M.), we have undertaken this study because we believe that careful selection and monitoring of suppliers is a necessary first step toward ensuring reliable and defect-free production. The results of this research should provide you with valuable information about how to select suppliers and how to manage them.

If by some chance you did not receive the questionnaire, or it got misplaced, please call us at 615-974-5033, and we will get another one in the mail to you today.

Thanks so much for your help.

Sincerely,

A handwritten signature in black ink, appearing to read "R. L. Jenkins".

Roger L. Jenkins, Ph.D.
President, Academy of Marketing Science
Professor of Marketing
Associate Dean for Graduate Business Programs

APPENDIX D
CORRELATION MATRIX

Table D-1: Correlation Matrix for the Factors Influencing Risk Propensity

	Age	Sex	Ed.*	Income	Size	Authority	Years**	Years***
Age	1.000 (.000)							
Sex	-.245 (.000)	1.000 (.000)						
Ed.	.091 (.035)	-.346 (.000)	1.000 (.000)					
Income	.446 (.000)	-.417 (.000)	.516 (.000)	1.000 (.000)				
Size	.167 (.000)	-.255 (.000)	.393 (.000)	.487 (.000)	1.000 (.000)			
Authority	.094 (.031)	-.067 (.124)	-.084 (.054)	.053 (.232)	-.139 (.001)	1.000 (.000)		
Years	.681 (.000)	-.266 (.000)	.010 (.814)	.395 (.000)	.149 (.000)	.163 (.000)	1.000 (.000)	
Years	.475 (.000)	-.115 (.008)	-.113 (.009)	.133 (.002)	.045 (.299)	.068 (.120)	.525 (.000)	1.000 (.000)

* Education

** Years Purchasing Experience

*** Years in the Present Position

Table D-2: Correlation Matrix for the Items in the Risk Propensity Measure

Q #1	Q #2	Q #3	Q #4	Q #5	Q #6	Q #7	Q #8
1.00							
Q #2	.253	1.000					
Q #3	.157	.213	1.000				
Q #4	.095	.090	.279	1.000			
Q #5	.151	.099	.066	.194	1.000		
Q #6	.092	.229	.117	.012	-.008	1.000	
Q #7	.077	.096	.064	.129	.240	.032	1.000
Q #8	.137	.122	.141	.189	.302	.010	.161
Q #9	.100	.080	.089	.084	.082	.066	.188
Q #10	.270	.176	.132	.213	.211	.021	.271
Q #11	.120	.105	.153	.077	.045	.160	.093
Q #12	.086	.123	.086	.074	.040	.084	.111
							-.043

Table D-2 (Continued)

	Q #9	Q #10	Q #11	Q #12
Q #1				
Q #2				
Q #3				
Q #4				
Q #5				
Q #6				
Q #7				
Q #8				
Q #9	1.000			
Q #10	.247	1.000		
Q #11	.231	.144	1.000	
Q #12	.114	.016	.138	1.000

Table D-3: Correlation Matrix for the Supplier Related Factors Mediating the Risk Handling Process

	SL	IM	INVP	INVC	TR	EX	FA	CR	PR
SL	1.000 (.000)								
IM	.117 (.011)	1.000 (.000)							
INVP	.163 (.000)	.022 (.637)	1.000 (.000)						
INVC	.146 (.001)	.074 (.105)	.415 (.000)	1.000 (.000)					
TR	.194 (.000)	.250 (.000)	.024 (.603)	.121 (.008)	1.000 (.000)				
EX	.102 (.025)	.525 (.000)	.109 (.017)	.121 (.008)	.176 (.000)	1.000 (.000)			
FA	.082 (.073)	.562 (.000)	.051 (.271)	.117 (.010)	.202 (.000)	.686 (.000)	1.000 (.000)		
CR	.112 (.014)	.326 (.000)	.008 (.868)	.088 (.056)	.576 (.000)	.208 (.000)	.245 (.000)	1.000 (.000)	
PR	.151 (.000)	.426 (.000)	.058 (.208)	.117 (.010)	.460 (.000)	.232 (.000)	.269 (.000)	.600 (.000)	1.00 (.000)

Note: SL indicates source credibility; IM perceived image; INVP personal involvement; INVC company involvement; TR perceived trustworthiness; EX perceived expertise; FA perceived familiarity; CR perceived credibility; PR perceived professionalism.

VITA

Jeonpyo Noh was born in Busan, Korea on July 10, 1959. He attended elementary and junior high schools in Busan, Korea and was graduated from Nam High School in Busan, Korea in February 1978. He entered Yonsei University in Seoul, Korea where he was graduated with a Bachelor of Business Administration in February 1982, and a Master of Business Administration in February 1984.

After collegiate teaching experience and military service, he entered The Graduate School of The University of Tennessee in August 1985. In April 1985, he married Hyungjeong, who gave birth to a son, Minwoo in September 1987. He received the Doctor of Philosophy degree with a major Marketing in December 1988.

The author is now Assistant Professor of Marketing at Syracuse University. He is a member of the American Marketing Association, the Academy of Marketing Science, and the Association of Consumer Research.