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THE EFFECT OF CONSUMERS' PLANNED PRODUCT HOLDING TIME ON RISK PERCEPTION AND ACCEPTABILITY

City University of New York PH.D. 1986

THE EFFECT OF CONSUMERS' PLANNED PRODUCT HOLDING TIME ON RISK PERCEPTION AND ACCEPTABILITY

by

CHARLES ASEMBRI

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4/14/86
date

Professor Leon G. Schiffman
Chairman of Examining Committee

4/14/86
date

Professor Sidney I. Lirtzman
Executive Officer

Professor Conrad Berenson

Professor Shulamith Gross

Professor Gary Soldow

Supervisory Committee

The City University of New York

Abstract

THE EFFECT OF CONSUMERS' PLANNED PRODUCT HOLDING TIME ON RISK PERCEPTION AND ACCEPTABILITY

by

CHARLES ASEMBRI

Advisor Professor Leon G. Schiffman

The primary objective of this study was to determine the impact of product holding time on consumers' risk perception and risk acceptance. That is, first, to determine if consumers' intention to hold onto a product for a long time influences their perception of risk in the product. Secondly, to determine if consumers' product holding time has any effect on their tolerance or acceptance of risks perceived in the products.

The test sample comprised of 293 respondents, each of whom was randomly assigned to one of five groups, representing five product holding time (PPHT) classifications. With the use of a self-administered questionnaire, each respondent's risk perception and risk acceptance in purchasing an atuomobile were evaluated within one product holding time dimension. The time dimensions were defined as greater than, equal to, or less than the average perceived useful life (10 years) of an automobile, as determined from a pilot study.

The hypotheses developed were based primarily on the proposition that a respondent's level of risk perception will vary directly with the length of planned holding time of a product. In addition, it was hypothesized that a respondent's risk tolerance (or acceptance) will be lower as product holding time (PPHT) increased.

The statistical techniques used include a (parametric) analysis of variance (ANOVA), a (non-parametric) one way analysis of variance (Kruskal-Wallis ANOVA) Multiple Classification Analysis (MCA), and Covariance Analysis (ANCOVA).

Overall, while there is evidence from the study to suggest that there are differences in risk perception relative to product holding time for some risk components, the evidence is not strong enough to conclude that there is always a positive relationship as hypothesized. The conclusion could be drawn that different risk factors are perceived differently relative to product holding time. For example, resale value risk is found to be most important to those who intend to dispose of an automobile early. On the other hand, safety risk which was found to be the most important risk element in automobile purchase is probably so important that there is no difference in perceived safety risk whether the consumer intends to hold onto the product for a short time or for a long time.

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I would also like to thank the members of my supervisory committee, namely Professor Gary Soldow, Professor Conrad Berenson and Professor Shulamith Gross. Professor Soldow was always ready and willing to review my work and provide valuable suggestions. Special gratitude is owed to Professor Berenson who gave me enough encouragement all along the way, and

despite his hectic schedules, never turned down any request to serve on my examining committees throughout my program. Professor Gross deserves my sincerest appreciation for her honesty and dedication in providing all the statistical advice that I needed. Dr. Gross was always thorough in reviewing my work and, above all, made sure she provided specific suggestions for resolving any issues raised. Her insistence on solving even problems that intially seemed only marginally important saved me a lot of headache in the end. I am deeply grateful!

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Finally, I would like to thank my loving wife Becky, who patiently shared all the frustrations during the course of my program, while at the same time giving me two beautiful daughters. My wife did not only create a peaceful atmosphere that was so important in the home, but also volunteered and typed the dissertation. To her and my daughters, Esenam and Kafui, who are yet to believe that "daddy no longer goes to school," my sincere love and gratitude for all the support.

DEDICATION

This work is dedicated to the memory of my parents, Comfort and Nicholas Asembri, who understood the value of education, and to my uncle John Adanuvor, whose selfless support has made this dream possible.

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CHAPTER 1

INTRODUCTION

One important element of the consumer decision making process which has received significant attention over the past two decades is the effect that consumers' perceived risk has on their product consumption behavior. Raymond Bauer (1960) conceptualized perceived risk in consumer behavior by stating that "consumer behavior involves risk in the sense that any action of a consumer will produce consequences which he cannot anticipate with anything approximating certainty, and some of which at least are likely to be unpleasant." (p.24).

At the core of perceived risk concept is the consumer's subjective evaluation of a product, an evaluation which results in different degrees of uncertainty about product performance, as well as an evaluation of the consequences of a product performing below one's level of expectation (Cox 1967; Taylor 1974; Ross 1974; Cunningham 1967).

The importance of perceived risk in an individual's purchasing behavior cannot be over-emphasized. Considering the limited resources and the limitless needs of the indivi-

dual, a consumer is continually faced with the problem of choice not only among different types of products, but also among different brands of the same product category. The existence of the numerous alternatives relative to the available resources creates the risk of probably making the wrong choice, or a choice that falls short of the consumer's expectation.

The understanding of the variables which go into the decision-making process of the consumer as they relate to the type and amount of risk perceived as well as the level of risk that the consumer is willing to accept is crucial for marketers. The amount of research which has been conducted and which continues to surface in this area is enough evidence of the importance of perceived risk in consumer decision-making (see Cox, 1967; Ross, 1975; Jacoby and Kaplan, 1972).

The Problem

Current research on perceived risk and its components has addressed three important factors which explain or contribute to the perception of risk. These factors may be classified as product-related factors, person-related factors and situational factors. Product-related factors impacting perceived risk include intrinsic (e.g. engineering, formulation, size), as well as extrinsic factors (e.g.

price, warranty, manufacturer's image) (Arndt, 1967; Baumgartner and Jolibert, 1977; Ostlund, 1974; Zikmund and Scott, 1973).

Person-related factors are those personality characteristics which may result in two consumers differentially evaluating the risks associated with the same product. These person-related factors include self-confidence (general and specific), venturesomeness, innovativeness, knowledge or experience and communication behavior (Arndt, 1968, 1972; Bell, 1967; Coppersmith, 1967; Cox, 1967; Dash, Schiffman and Berenson, 1976; Kogan and Wallach, 1964; Zikmund and Scott, 1973; Perry and Hamm, 1969).

Situational factors include mode of purchase (by phone, mail or in-person) type of store (e.g. specialty, department or discount store) and end-user of product (e.g. for self or for gift) (Belk, 1974; Lutz and Kakkar, 1975; Sandell, 1968; Vincent and Zikmund, 1975).

Irrespective of which of the above three factors is being considered as a determinant of perceived risk, the majority of past research on consumer risk perception has ignored the effect of product use time on risk perception (Jacoby, Szybillo and Berning, 1976). Thus, prior research assumes that consumers hold indefinitely onto the products they buy, and consume them in their entirety. However, this is not necessarily true since certain products are consumed

only in part, and are either discarded, traded-in for another, or given away. Furthermore, product consumption times vary significantly from product category to product category, or between durable and non durable products, as well as between brands.

One would, therefore, expect that the length of time that a consumer may be "stuck" with a product, whether by design (e.g. plans to use it in its entirety), or as a result of the nature of the product (e.g. the used product has no resale value or market, or the product has a very short life), will have a significant effect on the type of risks perceived (financial; social, psychological performance, etc.), and the amount or level of risk perceived (high, medium, low, etc.). It might also have a significant effect on the amount of information search that the consumer is willing to undertake to reduce the uncertainty or probability of loss (e.g. extensive information search or no information search) and the level of risk acceptance (high tolerance, low tolerance of risk).

As an example, consider a simple case of a student considering the purchase of an accounting book for use in preparing for his CPA examinations. The student may have a different evaluation of the amount of financial loss involved depending on whether he plans to keep the book for good or re-sell it to the store at a discount once the

examinations are over. Thus, one could state that while product, person, and situational characteristics would generally determine risk perception by the consumer, an important variable that will moderate, eliminate and/or reorganize the risk elements is the expected or planned duration of the product's consumption, whether the product is partially consumed, consumed in its entirety or held over its useful life.

In summary, the argument may be advanced that one could identify instances in which consumers will demonstrate and emphasize different types and levels of risk perception, and possibly different levels of product risk acceptance as a result of how long they intend to use a product. This could be the case since the expected or planned holding time might significantly affect the consumer's evaluation of risk, his assessment of the probability of product failure, as well as willingness of the consumer to accept a certain amount of risk involved in the product.

Study Objective and Importance

The objective of this study is to determine the effect of product holding time on consumer risk perception and acceptance. Specifically, the objective of the study is to provide information to support or refute the various aspects of the following statements which are broken down into

specific hypotheses in Chapter III. These statements are: 1) The amount and type of risk perceived in a product purchase and the level of risk acceptance are significantly influenced by the length of time that a consumer expects or plans to use a product relative to the perceived durability of the product. Thus, generally, perceived risks in a product will be greater if the consumer plans or expects to use the product for a long time rather than a short time. 2) The longer a consumer plans to hold onto a product, the less likely he or she is to accept the risks perceived in the product.

The preceding hypotheses are placed within the context of risk perception, as it relates to the time dimension of consumer decision making. As stated in the problem definition section, prior research in the area of perceived risk has not incorporated the time element of product consumption. Therefore, the effect of consumers' expectations or intentions regarding duration of product use on their risk perception and risk acceptance has not been investigated.

Furthermore, the idea of consumers tolerating a certain amount of risk in products has been suggested (Cox 1967, Rethans and Albaum 1980, Jacoby 1980, Venkatesan 1980). However, available research in the area has not investigated risk perception and risk acceptance in the same study to determine their relationship. The current research attempts

to establish if a relationship exists between consumers' risk perception and risk acceptability. The foregoing will help in determining if perceived risk studies relating to product purchase decisions need to incorporate an examination of the amount of risk that is acceptable to the consumer.

In summary, the objective of this research is to provide some answers to the following questions: 1) Does risk perception in a product vary with how long a consumer intends to use the product, and if so which specific types of risks are affected in this way? 2) Is risk that is perceived by a consumer less acceptable if the product is to be used for a long time instead of a short time? 3) Is a high risk perceived in a product also generally less acceptable to the consumer? It is hoped that answers to the above questions will provide significant contributions to the risk perception and acceptability knowledge in general, and a product consumption time dimension perspective in particular.

Scope and Limitations of Study

There is extensive research that has been reported in the risk literature dealing with consumers' product choice decisions and the impact of their risk perception on these decisions (See, for example, a review of the literature on

perceived risk by Ross, 1975). The current study focuses, not on risk versus choice relationship directly, but on the impact of the expected or planned holding time of a product on the level and type of risk perceived as well as the amount of the risk that the consumer is willing to tolerate. Therefore, the criterion variable in this study is risk perception (and also acceptability) rather than a product selection decision or an intention to buy.

The scope of this study, as stated above, is important in the sense that if a relationship is found to exist between risk perception and product holding time, it would become helpful in future research to incorporate the concept of product holding time into risk and product decision studies.

The concept of product holding time, while simple, is not in the risk literature, and is, therefore, quite extensively discussed in the next section. Whether a product is held for a long time or a short time is assumed to be relative to the useful life of the product; in the case of the individual, it is relative to his or her perceived useful life of the product.

The product category used for the study is automobiles, and the type of specific risks investigated are not necessarily unique to automobiles, but are specific enough to make it meaningful for the respondents to understand and

relate to them. The risk elements, however, fall into the generally used risk categories such as performance risk, social risk, financial risk, etc.

It should be pointed out that the study involves risk evaluations prior to product purchase (i.e. perceived risk prior to product purchase), and not risk evaluations and resolutions during the course of product usage, the latter phenomenon which would best be related to post-purchase dissonance.

Only one product category (automobiles) was examined in this study. However, it is an important and significant product investment decision for most consumers. It has also been shown to rank very high in consumers' product risk perception relative to other regularly used products (Jacoby and Kaplan, 1972).

Definition of Terms

This research involves consumer risk perception and acceptability relative to a time dimension, namely product use time. The concepts of risk perception and acceptance have been widely used in the risk literature and are extensively discussed in Chapter II of this study. Product holding or use time as applied in this study is rather novel. Therefore, a definition of this concept is presented below and discussed in some detail.

Product Holding Time

There are three conditions identified in this study under which perceived risk elements may be differentially evaluated by a consumer as a result of the duration of product usage, referred to in this research as "product holding time." The three conditions are:

1. The planned usage (or holding) time is the same as perceived useful life of the product (either by choice or as a result of the nature of the product).

2. The planned usage (or holding) time is shorter than perceived useful life of the product.

3. The planned usage (or holding) time is longer than perceived useful life of the product.

Condition One, where planned usage time is the same as perceived useful life, may be regarded as the traditional approach to examining perceived risk and its components, even though the literature does not explicitly make this distinction. This approach implicitly assumes that all products are consumed in their entirety by 'the consumer' being studied. That is, there is an implied assumption that the

product is held over its useful life. While the above assumption is valid for most non-durable products and some durable products, the assumption may not hold for a significant number of major consumer products, since some products are held for short periods and are either sold to another consumer, traded-in for another product or given away. For such products, one could examine the relationship between risk elements and duration of usage.

Condition Two is where the planned usage period is shorter than the expected useful life. This condition may arise as a result of various reasons which might result in early disposal of the product. These reasons might include consumer expectations of future income, or his disposition to change, as opposed to aversion to change. The possible implications of the shorter planned holding time include the following:

1. Consumer worries less about certain types of risk. For example, where a major purchase such as an automobile is involved, performance risk related to durability may be substantially discounted if the consumer plans to keep the automobile for only one year and trade it in for a new model; or, if a consumer plans on using the car for one year only, a five year warranty on maintenance and

repairs may not be as appealing as the assurance of a good resale value after one year.

2. Consumer may be prepared to absorb high levels of perceived risk since the risk may be considered temporary. For example, the social risk involved in the purchase of a dress for a friend's wedding may be very high but the consumer may consider it acceptable to a great extent on the grounds that the individual plans to use the dress for that particular occasion only. Therefore, any possible negative social response may be considered short-lived if the consumer discounts the likelihood of any lingering effects of such negative response from others.

3. Promotional messages may also be affected by the effect of shorter holding time, since such messages emphasizing benefits may be differentially evaluated by the consumer, depending on how long he or she plans to use the product. For example, performance risk (in terms of durability for products requiring maintenance) may not be as threatening as would be the case if product is held over a long time.

Condition Three is where the consumer exhibits higher expectations about the product than may be warranted, and plans to use the product longer than (his or her own evaluation of) the product's useful life. This situation might create the highest level of perceived risk (and probably the least risk acceptance), and the high level of risk may be attributed to the "unreasonable" expectations about the product's utility.

Perceived Useful life

The variations in product holding time as used in this research is defined in terms of the consumer's subjective evaluation of the useful life of a product, since "the measured time of consumption during which the good gives up the utility desired" (Aspinwall, 1962) is generally subjective. This subjective evaluation is important for the purpose of relating useful life to risk perception which is also a subjective phenomenon.

Organization of the Dissertation

Chapter II reviews the relevant literature on consumer risk perception, risk acceptability and the time dimension of consumer purchase decisions.

Chapter III presents details of the research design and methodology, including the hypotheses formulated for testing, and Chapter IV presents and discusses the results of the study.

Finally, Chapter V provides a summary of the results and conclusions, and discusses marketing implications and further research opportunities.

CHAPTER II

LITERATURE REVIEW

This chapter focuses on the theoretical foundations of perceived risk and its components, risk acceptability, as well as product consumption time.

The discussion on perceived risk includes the conceptualization of overall risk perception by consumers, the specific types of risk perceived in products, and summaries of some of the relevant studies undertaken in the area. The risk acceptability and product consumption time literature review also presents studies which are pertinent to this dissertation research.

Perceived Risk Concept

The concept of perceived risk which was formally conceptualized by Bauer (1960) falls within the general theory of perception, which within the context of consumer behavior, may be defined as "the process by which an individual selects, organizes and interprets stimuli into a meaningful and coherent picture of the world" (Schiffman & Kanuk, 1978 p.59). Thus, consumer perception theory may be said to deal with consumers' subjective evaluation of

products, ideas and services which they have had experience with or which they anticipate using to satisfy certain needs. Subjectivity is a key element of perception since, as Schiffman & Kanuk (1978) stated, "individuals make decisions and take actions based on what they perceive to be reality," and "reality to an individual is merely his perception of what is 'out there'" (p.58) and not objective reality.

In his conceptualization of perceived risk, Bauer (1960) indicated that he was only concerned with subjective risk, and not "real world" or objective risk, since only in rare instances would a consumer calculate risk probabilities and consequences when faced with a purchase decision. As with perception, the concept of perceived risk is, therefore, distinguished from objective risk since perceived risk implies that an individual can respond to and deal with risk only as he or she subjectively perceives it (Ross, 1975). Thus, if risk exists in the real world but the individual does not perceive it, one cannot be influenced by it. On the other hand, the individual may handle or reduce the perceived risk by a strategy which has no real world effect. Therefore, the concept of perceived risk deals with an individual's subjective evaluation of potential losses associated with products, services and ideas. (Bauer, 1960; Ross, 1975; Taylor, 1974)

The importance of perceived risk in an individual's purchasing behavior cannot be over-emphasized. Considering the limited resources and the limitless needs of the individual, the consumer is continually faced with the problem of choice not only among different types of products, but also among different brands of the same product. The existence of numerous alternatives adds to the risk of making the wrong choice, or a choice that falls short of the consumer's expectation. The understanding of the variables which go into the decision-making process of the consumer as they relate to type and amount of risk perceived as well as the methods employed to handle or reduce such risks is, therefore, crucial for marketers.

The Theoretical Foundation

In an overview of the theory of risk taking by consumers, Taylor (1974) stated that the central problem of consumer behavior is choice, and since the outcome of a choice can only be known in the future, the consumer is forced to deal with uncertainty, or risk. "Perception of risk," he stated, "is one pivotal aspect of consumer behavior because risk is often perceived to be painful in that it may produce anxiety, in which case it must be dealt with in some manner by the consumer." (p.54) He added that both the amount of risk perceived in a particular choice situation and the selection of methods for dealing with the

risk will be affected by the individual consumer's level of self-esteem. Furthermore, any choice situation always involves two aspects of risk, namely: uncertainty about the outcome and uncertainty about the consequences. Uncertainty about the outcome can be reduced by acquiring and handling information, while uncertainty about the consequences can be dealt with by reducing the amount at stake or by putting off the choice. In a choice situation, risk can be interpreted in terms of possible loss. The loss may be psycho/social or it may be a functional/economic loss, or some combination of both forms of loss. The interrelationship of the risk taking components based on Taylor's framework is presented in Figure 1 below.

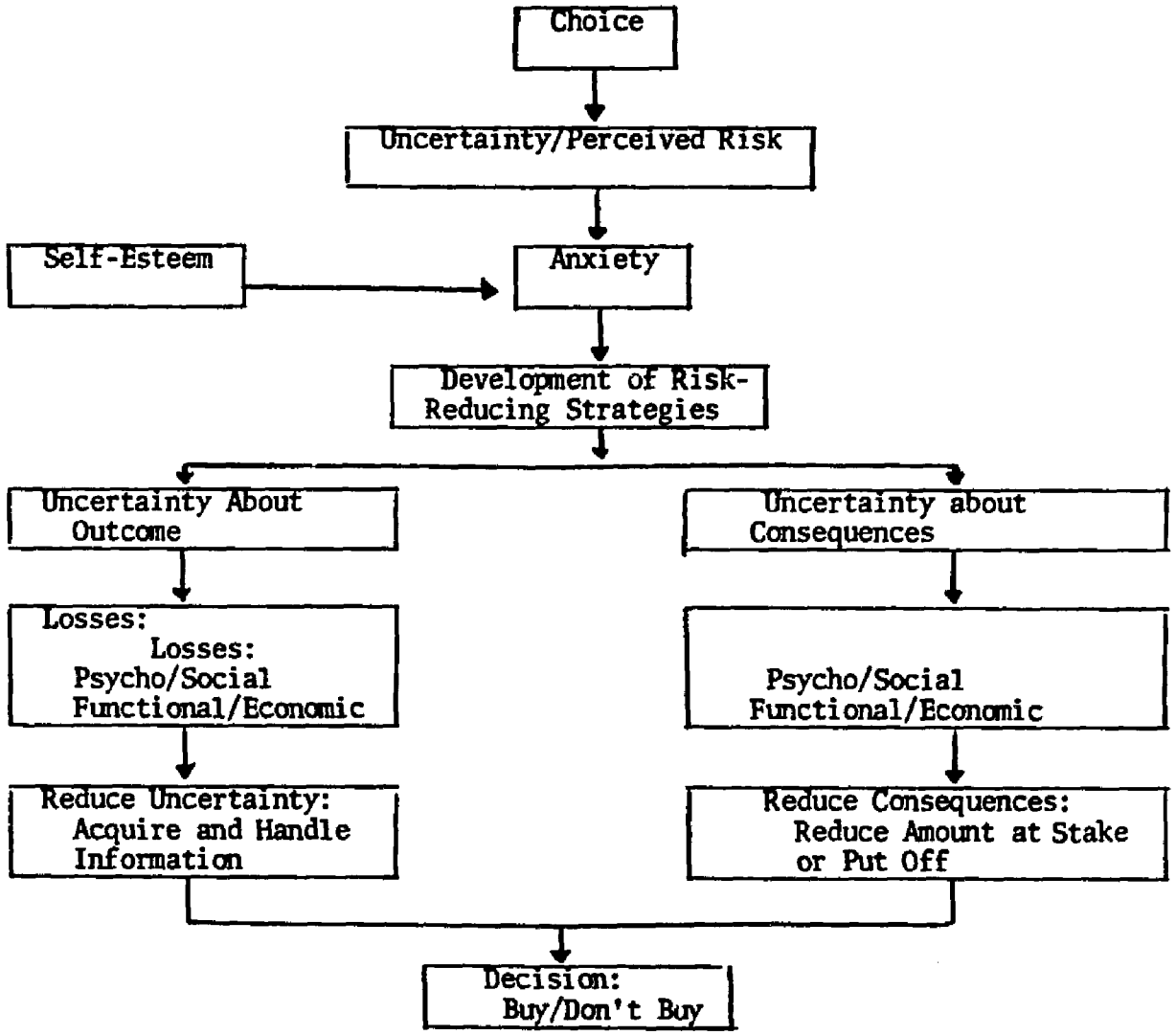
Interrelationships of Taylor's Model Components

The preceding theory as presented in Figure 1 postulates that choice situations involve uncertainty which creates some level of anxiety. Since anxiety is uncomfortable, consumers develop strategies to reduce the risk in those choice situations and thereby reduce the inherent anxiety. The theory suggests two types of risk that are involved in every choice situation. One type of risk is uncertainty about the outcome of the decision; for example, the uncertainty about whether the quality of the product will be as expected.

FIGURE 1

INTERRELATIONSHIPS OF COMPONENTS OF

RISK TAKING IN CONSUMER BEHAVIOR



Source: Adapted from James Taylor's Model in "The Role of Risk in Consumer Behavior," Journal of Marketing, Vol. 38 April 1974 pp. 54-60

The other type of risk is uncertainty about the consequences of making a mistake, that is, how important is the possible loss. For example, if the product is defective or substandard, could it pose any health hazards to the individual?

Both types of risk are believed to be present in every choice situation, but in varying proportion to each other depending upon the nature of the decision. Furthermore, the proportion of each type of risk perceived (psycho/social, etc) in a particular choice is assumed to be a factor in determining the types of risk-reducing strategies employed by the consumer.

Uncertainty reduction can be achieved through information acquisition from different sources (e.g. word-of-mouth), as well as through information processing, which refers to consumers' subjective evaluation of information for purposes of making a purchase decision. Reduction of consequences could be achieved by reducing one's level of aspiration or by completely avoiding the risky situation, and in effect forego any expected gain.

According to the model, self-esteem, or its equivalent, self-confidence, is hypothesized to influence consumer behavior in two ways. First, it contributes to the amount of anxiety that results from perceptions of the situation, i.e.

the realization that something must be accomplished or possessed and the sense that one's competence may be inadequate to the task is essential to the experience of anxiety (Fischer, 1970). The second way in which self-esteem influences consumer behavior is that it is instrumental in selecting appropriate risk-reduction strategies. As indicated by Coopersmith (1967), any experience may be the source of favorable self-evaluation, just as any experience can be the source of devaluating appraisals.

Cox's Conceptualization

In his discussion of the concept of perceived risk, Cox (1967) advanced some interesting arguments which, though not at variance with Taylor's model, are worthy of note. These arguments, as summarized below, relate to the assumption of risk in product decisions, and the amount of risk perceived.

When is Risk Involved? Cox explained that in identifying risk from the point of view of the individual, it will often be necessary to infer the presence of "perceived" risk, since consumers may be unable or unwilling to specify that a situation confronting them is risky. At a conscious level, consumers may never have thought about some of the things that may be labeled risk even though one's behavior may be affected by risk perceived at a subconscious level.

In order to be able to identify and analyze situations such as these, Cox (1967 a) advised that one has to "assume for operational purposes, that risk is, in some way, perceived by consumers in those situations in which they act in such a way as to handle (e.g. reduce) risk." (p.37)

Amount of Perceived Risk? Cox (1967) identified two factors which determine the amount of risk perceived in any behavioral situation. These are: (1) the amount that would be lost (i.e. that which is at stake) if the consequences of the act were not favorable, and (2) the individual's subjective feeling or degree of certainty that the consequences will be unfavorable. This means for example, that if the amount at stake is held constant, the greater the subjective probability of loss occurring, the higher the amount of risk, and vice versa. The above two factors correspond to Taylor's two types of risk: uncertainty about outcome and uncertainty about consequences. However, while Cox referred to them as factors which determine the amount of perceived risk, Taylor's model portrays them as types of risk. It probably seems more appropriate to refer to them as factors determining the amount of perceived risk, as Cox did in his conceptualization.

Inherent vs. Handled Risk

James Bettman (1972) raised a question of the conceptual definition and structure of risk when he made distinctions between two kinds of risk, namely inherent risk and handled risk. He defined inherent risk as "the latent risk a product class holds for a consumer, the innate degree of conflict a product class arouses in the consumer." (p.184) He defined handled risk as "the amount of conflict a product class engenders when the buyer chooses a brand from that product class in his usual buying situation." (p.184) Thus, handled risk "includes the effects of information and risk reduction processes as they have acted on inherent risk." (p.184) Ross (1975), in his review of the literature, takes note of Bettman's distinction. However, he concluded that the question of the conceptual composition of risk is difficult to address empirically. It should be pointed out that this distinction is not addressed in Taylor's theory presented above, and maybe rightly so, in view of the definitional argument advanced by Ross.

Types of Perceived Risk and Their Operationalization

This section examines the kinds of risk consumers may perceive in different buying situations and how they are measured. Since the point has been made that consumers are usually faced with risk in choice situations, it is

important for the marketer to be able to determine what types of risk are involved when a consumer is faced with the problem of choice of a particular type of product or a brand within that product class. This determination is essential for the marketer in his effort to aid the consumer in handling the risk(s) involved in that product or purchase situation, e.g. by communicating the right type of advertising message. It should be pointed out that risk may be involved not only in the choice of a particular product or of a product class, but also in specific buying situations. For example, shopping by phone or by mail may produce risks that compound the product risk already perceived by the consumer (Cox, 1964; Spence, Engel and Blackwell, 1970).

It is essential that the marketer knows about the different types of risk involved in a product before designing a strategy for risk handling. It is even more important for the marketer to be able to <u>determine</u> the specific types of risk consumers associate with his product and to <u>measure</u> the relative weights attached to those risks.

Types of Perceived Risk

Since Bauer's conceptualization of perceived risk in 1960, various authors have employed the construct in their consumer behavior research. Some of the early researchers

include Perry and Hamm (1969) who studied the relationship between socioeconomic risk and personal influence in purchase decisions, and isolated two types of risk which they called "social significance" and "economic significance". They explained that social significance "refers to how the purchase decision will affect the opinion other people hold of the individual." (p.351) Economic significance "refers to how the purchase will affect the individual's ability to make other purchases." (p.352) Thus, economic significance varies with the financial considerations of price in relation to factors such as the individual's income, ability to pay, and alternate uses for the money.

Roselius (1971) also identified four types of risk for which consumers develop different types of devices to relieve. He referred to them as four "kinds of losses" which "represent the ones which are widely different, easily explained, and commonly suffered." (p.58) These are "time loss," "hazard loss," "ego loss" and "money loss." He defined them as follows:

Time Loss: When some products fail, we waste time, convenience, and effort getting it adjusted, repaired, or replaced.

Hazard Loss: Some products are dangerous to our health or safety when they fail.

Ego Loss: Sometimes when we buy a product that turns out to be defective, we feel foolish, or other people make us feel foolish.

Money Loss: When some products fail, our loss is the money it takes to make the product work properly or to replace it with a satisfactory product.

In his study of perceived risk in new product trial by elderly consumers, Schiffman (1972) employed two types of risk, namely "taste risk" and "health risk." He measured uncertainty as well as the importance (or danger) components of these two types of perceived risk. The types of risk identified in Schiffman's study, namely taste risk (i.e., the new salt substitute would not taste as good as regular salt) and health risk (i.e. the new salt substitute would not be better for one's health than regular salt) represent specific types of risk which one can easily identify with the product (salt) under study, and the respondents in question (the elderly who are normally very health conscious).

On the assumption that consumers evaluate products on the basis of a few principal attributes, each of which represents a potential source of risk, Zikmund and Scott (1973) isolated (by use of factor analysis) different risk components for three product classes: color television sets, personal stationery, and metal lawn furniture.

The six risk components identified for color television sets were: performance reliability, social reaction, money loss, future opportunity (lost), unanticipated problem, self-expression/style. For personal stationery, they isolated the following three risk types: quality/performance expectations, shopping frustration, and psychosocial reaction.

Seven risk components were identified for metal lawn furniture; these were performance/quality, social reaction, unrealized expectation, future opportunity (lost), self-expression, in-store frustration, and adjustment or maintenance. The authors noted that the idea of breaking down perceived risk into product-specific components as above provides much more information about why a consumer perceives risk than an overall measure such as social or performance risk.

Consolidation of Types of Perceived Risk

Jacoby and Kaplan (1972) reviewed the literature on the types of risk referred to in various studies and came to the conclusion that the varieties of risk could be broken down into five broad risk types. Differences in terminology were discarded when it was evident that the terms were basically equivalent. In addition, they developed a series of hypothetical purchase situations and examined the types of risk that were potentially operative in each situation. From

their analysis, they came up with five types of risk, namely: financial risk, performance risk, physical risk, psychological risk, and social risk.

These distinctions were made with the conceptual assumption that these five dimensions of perceived risk can be considered functionally independent, such that as one risk variety increases, the other risk varieties can either increase, decrease, or remain the same. They observed that while psychological and social risk are usually combined and treated as one type of risk (i.e. psychosocial risk), psychological risk should probably be reserved for situations regarding how the individual perceives himself while social risk should refer to the consumer's perception of how others will react to his purchase. Between the time of the study by Jacoby and Kaplan and its publication (the study was conducted in 1970 and published in 1972), Roselius (1971) also identified a sixth type of risk which he labeled time loss; that is, "when some products fail, we waste time, convenience, and effort getting it adjusted, repaired, or replaced." (p.58) Several authors subsequently accepted this sixth classification of risk type by incorporating it into their studies (e.g. Peter and Ryan, 1976).

An examination of the six types of risk identified by Jacoby and Kaplan as well as Roselius shows the following commonalities with the studies referred to earlier. Perry

and Hamm's (1969) classification into "social significance" and "economic significance" can be appropriately incorporated into Jacoby and Kaplan's (1972) social and financial classifications respectively. This assumes that "financial" and "economic" are basically interchangeable terms. In Roselius' classification, he identified "hazard loss," "ego loss" and "money loss" (in addition to the "time loss" mentioned above).

Again, these three types of losses can be grouped, for all practical purposes, under physical risk, psychological risk and financial risk respectively. Schiffman's (1972) classifications of "health risk" and "taste risk" may be functionally reclassified as physical risk and performance risk respectively, with taste risk being considered a performance dimension that is specific to the product (salt) under study, and health as relating to one's physical condition.

Thus, one could say that the six classifications of risk types sufficiently act as representation for the possible risk types that are for all practical purposes experienced by consumers in their purchase decisions. Table 1 provides a summary of the various risk types identified and studied as outlined in the preceding sections. It should be pointed out that most researchers, since Jacoby and Kaplan (1972), have used all or some of the risk variable terminology employed by Jacoby and Kaplan.

TABLE I

SUMMARY OF SPECIFIC RISK VARIABLES STUDIED BY EARLY RISK RESEARCHERS

Researcher(s)	Year	Risk Variables Studied (or Identified)
Perry & Hamm	1969	1. Social Significance 2. Economic Significance
Roselius	1971	1. Hazard Loss 2. Ego Loss 3. Money Loss 4. Time Loss
Schiffman	1972	1. Taste Risk 2. Health Risk
Zikmund & Scott	1973	1. Performance Reliability 2. Social Reaction 3. Money Loss 4. Future Opportunity (lost) 5. Unanticipated Problem 5. Self-expression/style 7. Shopping Frustration 8. Adjustment or Maintenance
Jacoby & Kaplan (Consolidation of risk types based on review of earlier studies)	1972	1. Financial Risk 2. Performance Risk 3. Physical Risk 4. Psychological Risk 5. Social Risk 6. (Time Loss Risk-referred to, but not examined in their study).

Operationalization of Perceived Risk

A critical and yet very difficult issue with the use of the construct of perceived risk, as is the case with other hypothetical constructs, is its operational definition. The operationalization is necessary for any empirical studies to be done in the area. As Ross (1975) stated, "unless we 'know' what kinds of behaviors are manifestations of perceived risk, then it is always equivocal that we are really (validly) measuring risk." (p.11)

Based on the theoretical assumption that perceived risk has two components, namely uncertainty and consequences, researchers have designed measures to address the two components as was initiated by Cunningham (1967). Examples of early researchers using this approach include Schiffman (1972) in his examination of perceived risk in new product trial by the elderly, Peter and Ryan (1976) in their investigation of perceived risk at the brand level, and Hoover, Green and Saegert (1978) in a crossnational study of perceived risk, just to name a few.

Basically, the operational definition of perceived risk used by Cunningham (1967) included "questions designed to measure the perceived 'certainty' of a given event happening and the 'consequences' involved if the event should happen." (p. 85)

Cunningham (1967) measured the certainty component by the following question:

> "Would you say that you are: very certain; usually certain; sometimes certain, or almost never certain that a brand of headache remedy, (fabric softener, dry spaghetti) you haven't tried will work as well as your present brand?" (p. 84) (Note that the products under study were headache remedy, fabric softener and dry spaghetti).

The consequences component of risk was measured by the following question:

> "We all know that not all products work as well as others. Compared with other products, would you say that there is: a great deal of danger; some danger; not much danger; or no danger in trying a brand of headache remedy (fabric softener, dry spaghetti) you never used before?" (p. 84)

Some combination of the above two questions are assumed to represent perceived risk. In order to avoid the problem of evaluating the best combination of these two questions in terms of the ability to produce the strongest relationship between perceived risk and purchase behavior, Cunningham

(1967) constructed a perceived risk index by collapsing the two questions into a three-point scale and assigning a numeric value to each point on the scale. The two questions were then multiplied together in a matrix and each cell was thus given a specific weight that was used as the basis for ordering the combined index. The decision to group the perceived risk scale into three equivalent gradations was based primarily on an examination of the resultant cell sizes. The researcher stated that to obtain more gradations or levels of perceived risk in the study would have resulted in inadequate cell sizes in one or more perceived risk categories. Therefore, he indicated that it would be quite possible, and presumably acceptable to have more (or less) than three levels of risk, depending on the sample size as well as the objective of the researcher.

Cunningham (1967) acknowledged that there are certainly other ways of establishing a perceived risk scale. For instance, it would be possible to establish a percentage limit for the perceived risk distribution on each product category (for example, the top 30% or some other percentage would have been classified as high risk perceivers). This approach has intuitive appeal since it permits variations in the perceived risk cut-off point by product category. However, it is obvious that the perception of risk varies from product category to product category, and a constant

percentage limit would have clouded these product differences. An obvious problem with either of the scaling techniques above rests on the assumption that both the consequences and certainty components are equally weighted. This problem however, is currently unresolvable since the appropriate weights of the two components vis-a-vis each other are yet to be determined empirically.

Operational Definition of Specific Risk Types

The work of Cunningham (1967) cited in the preceding section provides a foundation for the operationalization of various types of risk. Cunningham's operational definition obviously addresses what may be referred to as the overall risk associated with a product, namely the uncertainty and consequences (or danger) components. Many researchers have, subsequently, utilized Cunningham's approach in developing their own operational definitions in ways that seem appropriate for their studies of specific risk types. Several of these studies are summarized in the following pages.

Jacoby and Kaplan (1972) developed an operational definition of risk types (Figure 2) which was used in a study conducted at Purdue University, the results of which were published in 1972. Jacoby and Kaplan explained that the operational definitions were constructed to be as basic and as uniform as possible, and were judged to be clear enough

Figure 2

OPERATIONAL DEFINITIONS OF THE VARIETIES OF PERCEIVED RISK

Type of Perceived Risk	Operational Definition	Anchor Points
1. Financial Risk	What are the chances that you stand to lose money if you try an unfamiliar brand of _____ (either because it won't work at all, or because it costs more than it should to keep in good shape)?	1=low chance of losing money; 9=high chance of losing money
2. Performance Risk	What is the likelihood that there will be something wrong with an unfamiliar brand of _____ or that it will not work properly?	1=low functional risk; 9=very functional risk
3. Physical Risk	What are the chances that an unfamiliar brand of _____ may not be safe; i.e., may be (or become) harmful or injurious to your health?	1=very safe; 9=very unsafe
4. Psychological Risk	What are the chances that an unfamiliar brand of _____ will not fit in well with your self-image or self-concept (i.e., the way you think about yourself)?	1=low psychological risk; 9=high psychological risk
5. Social Risk	What are the chances that an an unfamiliar brand of _____ will affect the way others think of you?	1-low social risk; 9=high social risk
6. Overall Perceived Risk	On the whole, considering all sorts of factors combined, about how risky would you say it was to buy an unfamiliar brand of _____?	1=not risky at all; 9= extremely risky.

Source: Taken from J. Jacoby and L. Kaplan, The Components of Perceived Risk, in M. Venkatesan (Ed.), Proceedings, Third Annual Convention of the Association for Consumer Research, 1972 (pg. 383).

to permit trained subjects to have similar ideas as to what each of the risk types meant. The definitions were meant to be general, although a specific object (an unfamiliar brand) is the focus of the ratings.

In the study, the subjects consisted of 148 upperclassmen who had completed a two-hour section on the topic of perceived risk. The research instrument was a questionnaire that was developed to measure both the amount of each specific type of risk (financial, performance, etc.), as well as overall perceived risk (OPR) the respondents associated with twelve different consumer products. Products were "intuitively selected to cover a substantial portion of the overall perceived risk (OPR) continuum." (p.384) The items included health, recreational and hygienic products which were considered to vary along an expensive - inexpensive dimension, and were chosen such that each would be appropriate for both male and female. The questionnaire was designed in such a way that only one risk type was assessed for the twelve products at a time and each risk type was defined. The product categories used included sports cars, life insurance, color television, suit, winter coat, dress shoes, deodorants, razor blades, toothpaste, vitamins, aspirin, and playing cards.

In their results, Jacoby and Kaplan (1972) noted that a certain degree of construct validity was established because "the order of risk components was the same within meaningful clusters of products." (p.384) For example, the rank order of the risk components for the three products which were items of apparel, (namely: suit, winter coat and dress shoes) was identical ranging from social risk as the highest, through psychological, financial, performance and finally to physical risk as the lowest. Similarly, the rank order of risk components for three of the drug products (that is, toothpaste, vitamins, and aspirins) was the same and ranged from physical risk through performance risk to financial risk, social risk and then to psychological risk. "It would seem" the researchers noted, "that similar types of products have similar risk component hierarchies." (p.384)

The authors also ranked the products by mean risk ratings for each specific type of risk, namely performance, financial, social, psychological, and physical risk. The rankings indicated that the three items of apparel (suit, winter coat, dress shoes) cluster next to each other for every specific risk type (except financial, for which only one product, Color TV breaks the cluster). The authors point out that this clustering phenomenon is another evidence of the validity of the measurement technique.

Kaplan, Szybillo and Jacoby (1974) reported another study which cross-validated the preceding study by Jacoby and Kaplan (1972). The results, as were the case with the first study, indicated that overall perceived risk (OPR) can be fairly well predicted with the five types of risk. In addition, the results confirmed those of the first study that similar types of products have similar risk hierarchies.

Perry and Hamm (1969) also studied the relationship between socioeconomic risk and personal influence in twenty-five purchase decisions. They found that the higher the risk involved in a particular purchase decision, the greater the importance of personal influence. In reference to the two specific risk types studied (i.e. social and economic), they found from their canonical analysis that in those cases where the correlation was significant, the social risk contributed more than the economic risk. They concluded that "the findings suggest that promotional strategies in a high risk purchase situation should try to reach consumers through personal channels (opinion leaders, word-of-mouth), rather than general media," (p.354) and that social benefits should be emphasized more than economic benefits in those high-risk situations.

Other studies employing perceived risk types include Vincent and Zikmund (1975) who investigated the situational

effects (purchase for own use and purchase as gift/type of store) on risk perception. Where the authors found significant effects, the magnitude of variance explained was low, which led the authors to accept Lutz and Kakkar's (1975) contention that one should not expect too much from situation in isolation.

Other studies include Prasad's (1975) investigation into product risk as a key variable in patronage profile analysis; Peter and Tarpey's (1975) study involving the relationship between automobile brand preference and amount and type of risk perceived; and Peter and Ryan's (1976) study on the perception of risk at the brand level (using brands of compact and intermediate cars). The latter concluded that perceived risk may be a predictor of brand preference only for market segments that perceived the potential loss as important, thereby emphasizing the saliency of a potential loss for brand preference purposes.

Manifestations of Specific Types of Perceived Risk

The perceived risk literature is extensive on the statement that consumers perceive risk in purchase situations. The reasons why consumers should or do perceive such risks have not always been stated. Schiffman and Kanuk (1978), however, provided several reasons why consumers perceive risk in their product decisions. These include the

fact that the consumer "may have had little or no experience with the product or product category she is considering - either because she has never used it or because it is new on the market." (p.85) Other reasons include unsatisfactory experience with another brand, or limited financial resources, which implies that the selection of one product means foregoing another purchase. The consumer may also perceive risk because she might have limited knowledge on which to base a decision, or because of lack of self-confidence in her ability to make the 'right' decision.

For research purposes, it is important to understand what types of uncertainty or anxiety are manifestations of the specific types of risk. In general, consumers may have specific types of uncertainty in their product decision-making. The different types of uncertainty that are related to the specific types of risk facing the consumer are shown in Table 2. It should be noted that the term functional risk used by the authors is equivalent to performance risk identified by Jacoby and Kaplan (1972).

TABLE 2

TYPES OF UNCERTAINTY FACED BY CONSUMERS MAKING PRODUCT DECISIONS

Type of Risk	Type of Uncertainty
Functional	1. Will it do what it's supposed to do? 2. Will it last? 3. Will it work as well as or better than competitive products?
Physical	1. Is it safe to use? 2. Does it pose any physical threat to others? 3. Does it pose any danger to the environment?
Financial	1. Is it the best use of my limited funds? 2. Is it worth the money (or time or effort) it costs?
Social	1. Will my family and friends approve? 2. Will it please others whose opinions are important to me? 3. Is it similar to products used by groups with whom I identify?
Psychological	1. Will I feel good using it? 2. Will it impress others? 3. Do I deserve it? 4. Will I make the right decision?

Source: L. G. Schiffman and L. L. Kanuk Consumer Behavior, Prentice Hall, N. J. 1978 (page 86).

Differences in Perceived Risk Measurement Methodology

In spite of the extensive research done in the perceived risk area, there is still lack of a general consensus on the measurement methodology or operationalization of perceived risk.

The basic approach commonly used is based on Cunningham's (1967) two factor model, namely the uncertainty and consequences components of risk. However, even within this methodology, there are variations in terminology and conceptualization. The different terminologies which have been used for uncertainty include likelihood (Jacoby and Kaplan, 1972; Vincent and Zikmund, 1975; Upah, 1980; Morris, 1984) and chance (Jacoby and Kaplan, 1972). Similarly, the consequences component has also been referred to as importance (Arndt, 1968; Schiffman, 1972; Vincent and Zikmund, 1975).

Furthermore, with respect to the conceptualization of perceived risk, the question is whether the two factor model is multiplicative or additive. Those who have treated the two factors additively include Peter and Ryan (1976) and Hoover, Green and Saegert (1978). Other researchers have defined perceived risk either unidimensionally (Jacoby and Kaplan, 1972, 1974) or have measured risk on both dimensions but treated each dimension separately (Choffray and Johnston, 1979).

The purpose of the current study is not to test which measurement methodology is best, but to employ a reasonably acceptable method. A two-factor method which is adapted from Vincent and Zikmund (1975) is used in this study since it provides the opportunity for measuring risk both from the combined two-factor perspective based on Cunningham's approach (1967) as well as separately using each factor as performed by Choffray and Johnston (1979).

It should be pointed out that a recent study by Lumpkin and Massey, Jr. (1983) investigated the convergent validity (that is, the degree to which two different methods of measuring the same construct "agree") of the two-factor (multiplicative) approach and a one dimension "riskiness" factor. They concluded that their exploratory work "seems to indicate that both measurement methods are valid to some extent." (p.260)

Risk Handling Strategies

In his original conceptualization of perceived risk, Bauer (1960) indicated that consumers characteristically develop strategies and ways of reducing risk in order to "enable them to act with relative confidence and ease in situations where their information is inadequate and the consequences of their actions are in some meaningful sense incalculable." (p.25) He explained that by saying "in some

meaningful sense incalculable" meant that not only is it difficult to anticipate the outcomes reliably, but also that the consequences may be drastic. Bauer emphasized the need to understand thoroughly the devices through which consumers handle the problem of risk. He suggested one device, namely the reliance on some outside source for guidance, where such outside source could be the reputation of a manufacturer or product (major brand image), an opinion leader (personal influence), or a reference group (group influence). He made references to the three types of outside sources by saying that 1) much brand loyalty is a device for reducing the risks of consumer decisions, 2) one of the important functions of opinion leaders is to reduce the perceived risk of the behavior in question, and 3) in many instances the function of group influence is to reduce perceived risk by confirming the wisdom of the choice.

Since Bauer's discussion in this area, a good number of research work has been done to understand consumer attitudes and behaviors as they relate to risk handling.

Empirical Studies on Risk Reduction Strategies

Sheth and Venkatesan (1968) identified three major ways of reducing uncertainty in their study of risk reduction processes in repetitive consumer behavior. These are 1) information seeking, particularly from informal, personal,

and buyer-oriented sources such as friends, reference groups, and family; 2) prepurchase deliberation enabling the buyer to digest information and structure his cognitions related to alternative brands; and 3) reliance on brand image (if one exists) which may in effect create brand loyalty.

Hisrich, Dornoff and Kernan (1972) studied the effect of repeat patronage of a store as a form of risk handling strategy. Their results, however, indicated otherwise. They found that for all three products studied (draperies, furniture, and carpeting) and at every level of perceived risk the number of store loyal buyers was less than the number of non-loyal buyers. They concluded that at the minimum, this suggests that these buyers did not consider repeat patronage as a viable risk-handling strategy, and that not shopping at a previously-patronized store might indeed have served as a form of risk reduction.

Locander and Hermann (1979) studied the effect of self-confidence and anxiety on information seeking in consumer risk reduction. They found that when consumers were faced with high performance risk decisions, those subjects who are high in specific self-confidence (perceived ability) chose to rely on their own observation or experience and Consumer Report type of publications, two sources which are independent and credible.

Perry and Hamm (1969) also found in their study of social and economic risks perceived by subjects that the higher the risk involved in a particular purchase situation, the greater the importance of personal influence.

Lutz and Reilly (1973) reached the same conclusion in their study of the effects of social and performance risk on consumer information acquisition when they found that word-of-mouth was the most important of the four external sources of information available to subjects. The other three sources studied were mass media advertising, rating magazine, and sales clerks.

Schiffman and Kanuk (1978) identified some of the more common risk reduction strategies. These include: 1) information seeking from both informal sources (family, friends, etc.) and formal sources (stores, advertisements, etc.), 2) brand loyalty, 3) reliance on major brand image, 4) reliance on store image, 5) buying the most expensive model, and/or 6) seeking reassurance by means of money-back guarantees, warranties, dependence on government and private laboratory test results as well as pre-purchase trials.

Perceived Risk and Personality

In his study of the major dimensions of perceived risk, Cunningham (1967a) noted that much of the psychological literature assumes that risk taking is a generalized ten-

dency and that certain people can be classified as "risk takers."

Taylor (1974) also addressed the personality dimensions of risk perception in his model (presented earlier) by defining the relationship between self-esteem (or self-confidence) and perceived risk. He hypothesized that self-esteem contributes to the amount of anxiety that results from the perceptions of the situation. He also noted that "the specific mechanism that is believed to link self-esteem and anxiety is the ability to perceive the possibility of loss, or the risk, in a choice situation." (p.59) Taylor referred to experimental studies which indicate that a person with a low self-esteem is less capable of resisting pressures to conform and is less able to perceive threatening stimuli.

Taylor noted that the majority of the available research on perceived risk and self-esteem has focused on the selection of risk reduction strategies. For example, such studies have shown that consumers' use of brand loyalty (Arndt, 1968), word-of-mouth communication (Cunningham, 1967b), interpersonal relations (Bell, 1967), and perceptions of sales personnel (Cox and Bauer, 1964), is determined to a great extent by level of self-esteem and perceived risk.

In more recent studies in the area, Dash, Schiffman and Berenson (1976) found that specialty store shoppers were significantly more self-confident than department store shoppers, and Locander and Hermann (1979) found that specific self-confidence has a significant impact on information seeking. That is, when consumers were faced with high performance risk decisions, those high in specific self-confidence (high level of confidence in being able to handle a specific task or solving a specific problem) chose to rely on their own observation or experience and publications such as Consumer Reports.

Cunningham's study (1967) examined the issue of whether perceived risk is a generalized personality tendency; that is, whether there is a substantial number of people who typically perceived a high risk, or who typically perceive low or no risk over a wide range of product categories. He examined the perceived risk distribution for respondents who were classified on perceived risk for all three product categories studied (headache remedy, fabric softener and dry spaghetti). He found that of the total respondents, 15% were high-medium in perceived risk on each of the three products, and 31.1% were low in perceived risk on each of the products. The differences between the above observed values and the expected values (5.7% and 18.5% respectively)

were both found to be statistically significant at the .001 level of significance, using a chi-square analysis.

The study concluded that "it appears that some people have a generalized tendency to perceive either high or low risk across a range of products." (p.98) Furthermore, the data suggested that if a person is high-medium in perceived risk on a low-risk product (dry spaghetti in this study), she is likely to be high-medium in perceived risk on high risk products (headache remedy here). The author found the reverse relationship to be less likely; that is, a person who is high-medium in perceived risk for a high risk product is not necessarily likely to be high-medium in perceived risk for a low risk product. Further analysis of the data using demographic variables came up with only one significant relationship; that is age was significantly related to perceived risk but only in the case of headache remedies; younger people were found to be less likely to be high in perceived risk than were older people. No significant relationships were found between either education, occupation, or number of children living at home and perceived risk for any of the products studied.

In an investigation of the relationships among overall risk, risk components, information handling and self-confidence, Zikmund and Scott (1973) did not, however, find any significant differences in risk perception among groups

described as high, medium, and low in generalized self-confidence for any of the product classes studied (including color TV, stationery, lawn furniture, and microwave oven). The researchers concluded that the personality variable, self-confidence does not appear to influence specific product risk or search behavior, at least for the product categories investigated in their study. Thus, the hypothesis that self-confidence is a key moderating variable in consumer risk perception or information search is not supported by this study.

Situational Dimensions of Perceived Risk

The question of whether buying situations have any effect on buyer behavior has been posed many times by consumer researchers with the answer being in the affirmative. Sandell (1968) for example, stated that a person's choice is highly dependent on the situation, such that an alternative with a high choice probability for a person in one situation does not necessarily have a high choice probability for the same person in another situation. Belk (1974) also observed that investigations of buyers' behavior which ignore situational effects are likely to result in good predictions only when the characteristics of buyers or choice alternatives are intense enough to be influential across all relevant situations.

Despite the apparent strength of the above argument, there have been problems with the development of situation-specific predictions of consumer behavior. These problems arise from the lack of consensus on the definition or meaning of situation, as well as from several other reasons, including the absence of systematic investigations to determine the salient components of purchase and consumption situations, and the unavailability of methods for assessing the importance and nature of situational effects.

In spite of the problems of definition, researchers have recognized the importance of situation in consumer behavior. As Belk (1975) indicated, by introducing situational variables into the research design, consumer psychologists should be able to account for more variance than by ignoring or controlling for them. However, as Lutz and Kakkar (1975) warned, the percent explained by situation per se is likely to be of the same magnitude as personality, so that one should not expect too much from situation alone.

Perceived risk researchers have recognized the importance of situational factors as they affect consumers' perception of risk. Situational variables that have been studied in relation to perceived risk include mode of shopping (e.g. by phone, mail or in-person), type of store (e.g. specialty, department, or discount), end-user (e.g. for self or for gift). Cox and Rich (1964) found that the

risk perceived in a telephone shopping situation is higher than that experienced in a corresponding instore situation. Spence, Engel, and Blackwell (1970) also found that there is a significantly greater perceived risk in buying products by mail than in buying the same products from a salesman or a retail store. As Vincent and Zikmund (1975) noted, each of the above two studies indicate that perceived risk is affected by factors other than product and that "the place of shopping, a situational factor, influenced perceived risk." (p.125) The preceding studies suggest that risk is not only experienced in what (product) is acquired, but also experienced in how or where the acquisition is made.

Several studies have also examined the risk involved in store selection or choice. Hisrich, Dornoff and Kernan (1972) postulated that when brand loyalty cannot be developed, consumers may handle the risk involved in their purchase decisions by shifting their focus to the retail store. In their study involving the purchase of carpeting, draperies and furniture, they found that a store's influence with regard to risks involved in an acquisition can be as strong as the product's influence.

Prasad (1975) also found that consumers in the higher socioeconomic strata are more likely to exhibit "patronage mix" tendencies, probably preferring to patronize the more conventional department stores and specialty stores for the

purchase of products with higher social risk. These consumers are, however, favorably predisposed to patronize the discount store for a vast number of other products that may be characteristized as of low social risk.

Dash, Schiffman and Berenson (1976), in a study on the risk and personality related dimensions of store choice, found that for the purchase of audio equipment, specialty store customers perceived less risk than those who shopped for similar items in a department store.

In an experimental investigation of situational effects on risk perception, Vincent and Zikmund (1975) tested the relationship between specific buying situations which are not related to physical surroundings, (namely home usage versus wedding gift) and the various dimensions of perceived risk (social, financial, etc.) in purchasing an electric knife. While some statistically significant relationships were found, the magnitude of the variance explained in those statistically significant cases were quite low, prompting the researchers to caution that one should not expect too much from situation in isolation. They, however, concluded that it appears that theoretically, buying situations, along with individual differences and product characteristics, may play a part in determining perceived risk.

Risk Acceptability

The issue of what level of risk is "acceptable" by the consumer falls within the general sub-category of risk handling. The risk acceptability phenomenon has recently achieved some prominence in the risk literature primarily as a result of a dissertation research by Rethans (1979). Rethans' research was aimed at pointing out (particularly to the Consumer Products Safety Commission) that while high levels of risk may be objectively associated with a particular product, consumers do evaluate risks subjectively, and do accept a certain level of risk element in the products they buy.

As suggested by Rethans and Albaum, a consumer would probably prefer that there are no risks associated with a product. However, products with zero risks may not exist. Therefore, there is a certain amount of risk that one is willing to tolerate or accept (Slovic, Fischhoff and Lichtenstein, 1980; Rethans and Albaum, 1980). The amount of risk consumers are willing to tolerate may be referred to as the threshold of risk acceptability.

It should be pointed out that despite the recent emphasis on the risk acceptability issue as shown in Rethans (1979), Rethans and Albaum (1980), Jacoby (1980), Slovic, Fischhoff and Lichtenstein (1980); Venkatesan (1980), the risk acceptability issue had long been raised by Cox (1967)

and the notion subsequently used by Deering and Jacoby (1972) in their theoretical discussion on risk handling.

Cox (1967) advised that in studies relating to risk handling, researchers should make explicit the notion that consumers probably have "ideal" or "tolerable" levels of uncertainty, consequences, and risk. Consequently, perceived risk must be considered in relation to the ideal or tolerable level. Thus, while "we cannot always try to reduce the perceived risk, it might be predicted that consumers will try to reduce the variance between the actual and the ideal."(Cox 1967, p.630) The three ways identified by Cox are: 1) When perceived risk exceeds desirable and tolerable risk level (when there is a positive risk variance and the situation is overrisky), risk reducing behavior will tend to be invoked. 2) When perceived risk is less than desired (when there is a negative risk variance and the situation is underrisky), a consumer may tend to engage in risk increasing behavior, particularly if current brand is known to be below acceptable level of the consumer. 3) When perceived risk approximates that which is desirable (when there is little or no risk variance and the situation is one of tolerable risk), consumers will tend not to act to reduce or increase perceived risk.

The above exposition clearly indicates that the issue of a certain amount of risk acceptability by consumers is

not new, but that its importance has been heightened and brought into focus as a result of the increasing level and concern by government agencies in regulating product usage (Rethans and Albaum, 1980; Jacoby, 1980; Dedler, Gottschalk and Grunert, 1980; Jacoby, Szybillo, and Berning, 1976)

The concept of risk acceptance is important in the present study because of its implications for the time dimension of risk perception. The probability of an individual perceiving less risk in a product as a result of a short planned usage period may be due to the individual's pre-disposition towards the risk elements, and an important variable in that pre-disposition would be his willingness to "take a chance." This chance-taking attitude probably reflects either low risk perception or high risk acceptance, or both, because the consumer probably estimates that product failure is less likely within the short time he plans to use the product. On the other hand, it may be possible that the consumer attaches less importance to the consequences since, no matter how serious the consequences might be, the consumer considers them only temporary and hence attaches less weight to them.

Operational Definition of Risk Acceptance

In comparison to perceived risk, to date there has been quite a limited number of studies reported on the concept of

risk acceptability. Therefore, few operational definitions of the concept have appeared in the literature (Rethans and Albaum, 1980; Slovic, Fischhoff and Lichtenstein, 1980). The operational definition used in this dissertation research is based on that developed by Rethans and Albaum (see Figure 3). Rethans and Albaum's methodology may be described as a Likert-type one item bipolar scale measuring an acceptability/unacceptability dimension. Their scale was specifically designed to measure safety (or hazard) risk acceptability for a variety of products. The basic framework which involves direct rather than indirect measurement of risk acceptability may be considered appropriate for measuring not only safety risk acceptability, but also the acceptability of other risk components.

Product Consumption/Holding Time

> When a consumer chooses a product, he is ultimately making a decision about how to spend what is frequently a scarcer resource: time .....Time interacts with consumer behavior in several ways. Consumers invest large quantities of time in gathering product information, often called shopping behavior. Equally important, but much less the subject of attention, is the act of consumption itself. An expenditure of time is involved each time a product is used, and the consumer's perception of that time may influence both his product choice and the way he uses it. (Schary, 1971 p. 50)

FIGURE 3

Rethans and Albaum's Operationalization of Risk Acceptance

Acceptability of Risk

Now that you have evaluated the risks associated with some consumer products, we would like you to judge the acceptability of these risks. Ideally, risk should be zero. However, products with zero risk do not exist. Rather, we decide whether or not risks associated with product are at a socially (from a societal viewpoint) acceptable level. An acceptable level is a level that is "good enough", where "good enough" means that you think that the advantages of increased safety are not worth the costs to society or reducing the risk by altering the product or restricting its use.

Please indicate your views on the acceptability of the risks by circling the number on the scale that best describes your opinion.

	From a societal viewpoint, the present level of risk of this product is:	
	Very Unacceptable	Very Acceptable
1. Household ammonia	1 - 2 - 3 - 4 - 5 - 6 - 7	
2. Sewing machine	1 - 2 - 3 - 4 - 5 - 6 - 7	
3. Snow skis	1 - 2 - 3 - 4 - 5 - 6 - 7	
4. Etc.	1 - 2 - 3 - 4 - 5 - 6 - 7	

Source: Jacob Jacoby, "Some Perspectives on Risk Acceptance" Advances In Consumer Research, (1980 p.513)

The above quote shows the importance the author (Schary) attaches to the idea of time and consumer behavior. However, as he subsequently indicates, "time has been largely ignored in marketing" and "has been almost completely avoided in any discussion of the actual process of product utilization per se." (p. 51)

In an interdisciplinary overview of the influence of time on consumer behavior Jacoby, Szybillo and Berning (1976) pointed out that consumer behavior related to the acquisition and consumption of both products and information about products are not cross-sectional events of short and unvarying duration; rather, they are dynamic processes that occur over time and may involve different spans of time from one occasion and one individual to another. They also indicated that "historically, economists have regarded consumption as an instantaneous act without temporal duration or consequences," (p. 320) an assumption which is "apparent in most supply/demand analyses, in which the time an individual has to consume the commodity is rarely considered." A handful of the literature dealing with consumption time include Linder (1970), Maybry (1970), and Becker (1965).

Some of the above researchers, however, concentrated on the relationship between leisure or non-work time and consumption. Becker, for example, stated that a rise in the

cost of time relative to the cost of goods would induce a reduction in the amount of time and an increase in the amount of goods used per unit of commodity; therefore, the tendency to be economical about time and lavish about goods might simply reflect a reaction to a difference in relative costs.

Linder (1970) observed that if people have an excess of consumption time, they will invariably take some form of extra paid work; this, in turn, will increase the money that they can spend to absorb more consumption time.

In the psychological literature, Berlyne (1957) hypothesized that due to increased psychological conflict, free-choice decisions would take more time to make than forced-choice decisions; and Lotsof (1966) found that the greater the value an individual placed on the outcome of a discrimination task in which he had to select one of a set of reinforcements (e.g. selecting one brand) the longer he took in arriving at a decision.

The marketing literature has several cases of researchers at least recognizing the importance of time in consumer behavior. For example, Howard and Sheth (1969) incorporated time in their buyer behavior theory by treating Time Pressure as a major exogenous variable affecting consumer behavior. Engels, Kollat and Blackwell (1973) also suggested the importance of time by pointing out the need

for recognizing the difference between extended and habitual decision making. Furthermore, Kotler (1972) made observations about the trend that Americans are increasingly placing more value on time than on goods.

Of special relevance to this dissertation research is the works of Aspinwall (1962), Katona and Mueller (1954) and Miracle (1965). Aspinwall, in his research, identified five "characteristics" of goods which he labeled as (a) replacement rate (b) gross margin (c) adjustment (d) time of consumption, and (e) searching time. Aspinwall defined time of consumption as "the measured time of consumption during which the good gives up the utility desired." (p. 440) He indicated that time of consumption as a characteristic pertains to all goods, and the amount of this time is relatively measurable. Aspinwall's definition of consumption time is relevant in this study as it relates to the idea of "product holding time" as well as the product's useful life. He also defined searching time as the measure of average time and distance from the retail store, and hence the convenience the consumer is afforded by market facilities.

In another theoretical exposition, Miracle (1965) identified characteristics of products similar to Aspinwall's, namely, the "rapidity of consumption", which refers to how soon a product is consumed to the point where it gives up its utility, and "time and effort spent

purchasing by consumers." The latter may include time and effort spent on information acquisition related to the purchase.

Katona and Mueller (1954) probably have the most interesting suggestions that are pertinent to the current research. They suggested that the relationship between the price of good and external search for information may reflect the influence of the length of time the consumer is committed to the product; that is, high priced items would generally entail long periods of consumer commitment to the product. In addition, the length of commitment may necessitate more extensive information search on the part of the consumer. However, Katona and Mueller did not find, as would have been expected, that all or most purchases of large household goods are made after careful consideration or deliberation, or that a long planning period was involved; nor did they find that all or most such purchases are preceded by extensive information seeking or shopping around.

The preceding findings by Katona and Mueller may suggest that consumers' evaluation of the benefits and risks as well as their readiness to seek information do not depend on only the significance (price or size) of the purchase, but may also involve other considerations that are significant to their decision. One of these considerations might

be the duration of consumption or commitment to the product. The present study is aimed at examining the effect of the length of commitment to a product on risk perception and risk acceptability since the holding time concept may contribute to a consumer's apparent lack of careful pre-purchase deliberation found by Katona and Mueller (1954).

CHAPTER III

RESEARCH DESIGN AND METHODOLOGY

This chapter presents the design of the research and the methodology used. The specific topics covered include the determination of the approach, the pilot study, the research instrument, interviewers and sample of respondents. It also discusses the conceptual paradigm and the variables included in the study, the hypotheses developed for testing, as well as the statistical procedures used to test the hypotheses.

Approach

As stated earlier in the introductory chapter of this dissertation the major independent variable of interest which is "Planned Product Holding Time" (PPHT) is defined relative to the "Perceived Product Useful Life" (PPUL), that is, the useful life of a product as perceived by the consumer. In order to measure the PPHT relative to the PPUL, two approaches were considered. The first approach considered was to measure each respondent's PPUL directly by asking him/her to indicate what they expect the useful life

of the product to be. The second approach considered involved conducting a pilot study to determine an average PPUL which would then be incorporated into the design of the second stage of the research design and data collection. The second approach was regarded as more appropriate since the first was more prone to sensitize respondents. Furthermore, it was considered possible to statistically eliminate some of the potential errors of the second approach by determining and controlling for the research sample's PPUL through a covariance analysis. Therefore, stage One of the data collection involved a pilot study to determine the average useful life of the product, as perceived by respondents.

Pilot Study

The pilot study conducted involved 104 respondents. The primary objective of this pilot study was to determine the perceived useful life of the product under consideration, an automobile. Through an open-ended questionnaire, the question was asked as to what the respondent thought the total life span of a car was. The respondents were selected "at random" from different segments of the society within various localities of the New York area. There was a very high rate of cooperation primarily because of the short length of the questionnaire, and also because the subject

matter which involved automobiles was rather exciting to the respondents. Only two subjects turned down the request to participate, and four additional responses were not usable. The questionnaire was self-administered and comprised a few questions other than the one relating to perceived useful life. The additional questions were designed to help determine how similar or dissimilar the pilot sample and the final research sample were, since this was considered important, especially as a result of using the pilot samples responses in determining how to manipulate the independent variable, PPHT. See Appendix I for for pilot study questionnaire.

Research Instrument

The results of the pilot study were incorporated into the design of the second stage of the research methodology. The mean perceived useful life of an automobile, as determined from the responses of the pilot sample, was 9.71 years, with a standard deviation of 3.60 and a standard error estimate of .35. The median was 9.68 and the mode 10.0 years. Based on the above sample statistics, the true mean perceived useful life was estimated to be approximately 10 years. Therefore, the design of the second stage assumed that the average perceived useful life of an automobile was 10 years. The research instrument (a self-administered

questionnaire) was then developed with the Planned Product Holding Time (PPHT) manipulated in such a way that for each respondent, the PPHT was either greater than, equal to or less than the mean PPUL of 10 years. Each respondent was presented with one and only one PPHT and was asked to assume that he or she intends to buy and use the product for that period of time. Respondents were not allowed to make their own choice as to how long they would use the car. The PPHT was determined by the questionnaire presented to a respondent, since each questionnaire had a pre-determined PPHT. Five variations of the questionnaire representing five PPHTs were used, and each respondent was randomly assigned one and was not aware of the presence of the other four PPHTs. A sample of the research questionnaire is attached (Appendix II).

Sample of Respondents/Interviewers

The respondents consist of male and female consumers selected within the New York area. Personal visits were made to respondents' homes where interviewers explained the purpose of the study. An interviewer then dropped off the questionnaire which the respondent was instructed to complete for the interviewer to pick up a day or two later. Where there was more than one person in a household, they were advised to have only one adult independently complete the questionnaire.

The interviewers were senior college students of Consumer Behavior at a private university in the New York area. The students had been used as part of the sample in pre-testing the questionnaire, and were subsequently instructed in how best to explain the intention of the study as well as the difficult parts of the questionnaire to the respondents.

Test Product

Automobiles were selected because they are a major purchase for most consumers, ranking second only to the purchase of a house. It is also a product that consumers often dispose of at different points in time relative to the product's useful life, features which are important for the time dimension measurements hypothesized. Furthermore, the product is purchased and used by both males and females. Table 3 presents some basic statistics for the sample of respondents, and is followed by a summary of the research methodology (Table 4). The original intention was to obtain an equal number of respondents (65) for each group. However, this goal could not be achieved due to the number of non-usable responses from each category, mainly as a result of incomplete answers. The unequal number of respondents is, however, not a problem here because the design is basically a one factor experiment.

TABLE 3

SELECTED SAMPLE STATISTICS

TOTAL SAMPLE SIZE = 293

SEX COMPOSITION OF SAMPLE

MALE = 149 (51%)

FEMALE = 144 (49%)

HOUSEHOLD SIZE

ONE MEMBER = 47 (16%)

TWO OR MORE = 246 (84%)

ANNUAL INCOME OF HOUSEHOLD

$35,000 AND OVER = 138 (47%)

LESS THAN $35,000 = 155 (53%)

AGE

UNDER 25 = 118 (40%)

25 - 44 = 109 (37%)

OVER 45 = 66 (23%)

CAR OWNERSHIP (LIFETIME)

NEVER OWNED A CAR = 22 (8%)

HAS OWNED AT LEAST ONE CAR = 271 (92%)

CAR OWNERSHIP (CURRENT)

NO CAR AT PRESENT = 26 (9%)

CURRENTLY OWN CAR = 267 (91%)

MARITAL STATUS

MARRIED = 131 (45%)

SINGLE = 146 (50%)

SEPARATED/DIVORCED/WIDOWED = 16 (5%)

OCCUPATION

PROFESSIONAL/TECHN = 54 (18%)

MANAGERIAL/ADMIN = 56 (19%)

SALES/SERVICE = 55 (19%)

CLERICAL/OFFICE = 80 (27%)

CRAFTSMAN/TRADE = 21 (7%)

HOUSEWIFE = 13 (5%)

UNEMPLOYED/RETIRED = 14 (5%)

PERCEIVED USEFUL LIFE OF A CAR

MEAN = 9.94 YEARS

STD. DEVIATION = 3.84

STD. ERROR = 0.22

MEDIAN = 9.73

MODE = 10.00

TABLE 4

SUMMARY OF THE RESEARCH METHODOLOGY

Stage 1

Using a small sample, a pilot study was conducted to determine perceived product useful life (PPUL) of the selected product (The selected product category is automobile).

Stage 2

Assumption: Mean PPUL is estimated = 10 years (as determined from pilot study (Stage 1)

Measure Overall Perceived Risk (OPR), Specific Perceived Risk (SPR) and Risk Acceptance (RA) of a sample of respondents while manipulating Planned Product Holding Time (PPHT) as follows:

Five PPHTs, Representing Five Groups:

(i) Groups I and II: Manipulate PPHT such that PPHT < PPUL (PPUL as determined in pilot study)

(ii) Group III : Manipulate PPHT such that PPHT = PPUL

(iii) Groups IV and V: Manipulate PPHT such that PPHT > PPUL

The distribution of the research sample into the five PPHT groups defined above were:

Group I	(PPHT = 1 YR)	: 58 Respondents
Group II	(PPHT = 5 YRS)	: 60 Respondents
Group III	(PPHT = 10 YRS)	: 57 Respondents
Group IV	(PPHT = 12 YRS)	: 57 Respondents
Group V	(PPHT = 12+ YRs)	: 61 Respondents
Total		: 293 Respondents

Conceptual Paradigm and Variables

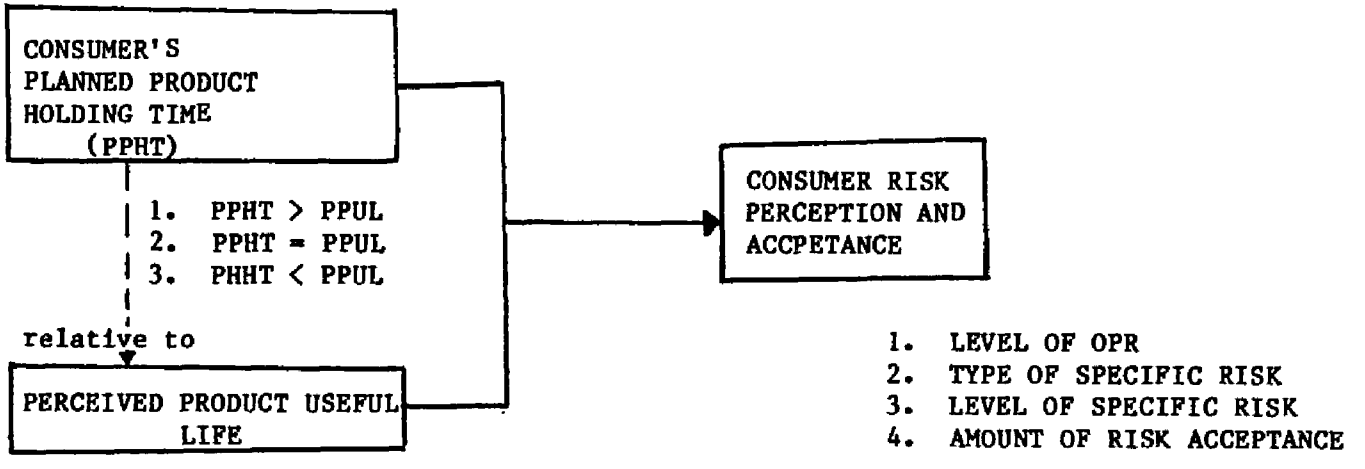
Figure 3.1 is a presentation of the interrelationships of the various facets of the problem as conceptualized for testing, and Figure 5 is a summary of the variables included in the study, their components and definitions as well as the sources of their definitions.

Discussion of Conceptual Paradigm

The paradigm consists of a consumer's "Planned Product Holding Time" (PPHT) which is measured relative to the consumer's "Perceived Product Useful Life" (PPUL). It is conceptualized that this PPHT would have an influence on the consumer's risk perception as well as influence on the risk acceptance of the consumer. The PPHT, defined relative to PPUL, could be greater than, equal to, or less than PPUL. That is, a consumer buying a product might plan on using that product for a shorter period than his perception of the product's useful life. On the other hand he could plan on using it for a period that is just as long as his PPUL, or for reasons known to himself, intend to use it longer than what he perceives the useful life of the product is. The planned holding time of a product is conceptualized to influence the consumer's overall perception of risk (OPR) in the product, as well as amount and type of specific perceived risks (SPR). Furthermore, the planned holding

FIGURE 4

CONCEPTUAL PARADIGM



Definitions

1. PPHT = Consumer's Planned Holding Time of a product
2. PPUL = Consumer's Perceived Useful Life of a product
3. OPR = Overall Perceived Risk
4. SPECIFIC RISK = financial risk, performance risk, etc.

FIGURE 5

VARIABLES AND THEIR COMPONENTS

VARIABLES	COMPONENTS/DEFINITIONS	SOURCES/BASIS
DEPENDENT VARIABLE(S)		
1. AMOUNT OF PERCEIVED RISK		
(a) OVERALL PERCEIVED RISK (OPR)	TWO COMPONENTS OF OVERALL RISK o Uncertainty (Likelihood of Risk) o Consequences (Importance of Risk)	Cunningham (1967)
(b) SPECIFIC PERCEIVED RISKS (SPR)	UNCERTAINTY AND CONSEQUENCES REGARDING: o Durability of Product o Safety of Product o Social Approval of Product o Value/Financial Worth of Product o Comfort provided by Product o Gas Mileage of Product o Resale Value of Product	Jacoby and Kaplan (1972) Vincent & Zikmund (1975)
2. RISK ACCEPTANCE	Measurement using 9 Point Risk Acceptability Scale with 1 = Extremely Unacceptable, 9 = Extremely Acceptable	Rethans and Albaum (1980)
INDEPENDENT VARIABLE(S)		
PLANNED PRODUCT HOLDING TIME (PPHT) relative to PERCEIVED PRODUCT USEFUL LIFE	- PPHT SHORTER THAN PERCEIVED USEFUL LIFE (PPUL) - PPHT SAME AS PPUL - PPHT LONGER THAN PPUL	))As defined in this research)

time is assumed to impact the consumer's acceptance of the risks that the consumer perceives in the products, since, certain risks may be more acceptable than others if the chances of their occurrence are considered less likely over a short period compared to a longer period of product usage.

Hypotheses

In line with the preceding discussions and the conceptual paradigm, the following hypotheses are developed for testing in this research. The hypotheses are grouped into three main categories: 1) those dealing with consumer's risk perception relative to product holding time; 2) those dealing with a consumer's risk acceptance relative to product holding time; and 3) those concerning the combination of a consumer's risk perception relative to risk acceptance within the framework of product holding time. The hypotheses are presented below in accordance with the above specified categories.

Hypotheses dealing with Risk Perception and PPHT

Hypothesis 1 is presented as an overall hypothesis relating risk perception and product holding time. This hypothesis is then expanded into product-specific risk factor hypotheses for testing. The breakdown into product specific risk hypotheses is necessary because, as Zikmund

and Scott (1973) stated, the idea of breaking down perceived risk into product-specific components provides much more information than an overall risk measure.

Hypothesis 1

The longer a consumer's planned product holding time (PPHT) the higher the consumer's overall perceived risk (OPR) in the product.

As explained earlier in the methodology section, planned product holding time (PPHT) is defined relative to perceived product useful life (PPUL), such that PPHT may be longer than, equal to, or shorter than PPUL. The above measurement methodology makes it possible to retain the individual's subjective element of risk perception. This hypothesis assumes that consumers do not necessarily consume entirely the products they purchase, and that they may hold onto the products for varying amounts of time. Therefore, it is hypothsized that if a consumer plans or expects to use the product for a long time, he or she is more likely to perceive a higher probability of loss resulting from the failure of the product, hence higher overall perceived risk. The next hypothesis relates to a specific risk type:

Hypothesis 1(a)

The longer the planned holding time of a product, the higher the importance a consumer attaches to the product's durability, and hence the higher the durability risk.

If a consumer plans to use a product for a long time (PPHT) relative to the perceived useful life of the product (PPUL) the consumer will tend to attach greater "importance" to durability and hence will perceive a higher durability risk than if PPHT were short relative to PPUL. The above hypothesis implies that the "importance" component of durability risk (the other component being "uncertainty") will vary directly with PPHT and, therefore, significantly influence risk perception. Similar hypotheses can be tested for other specific risk types, hence these are included in the list of hypotheses presented below.

Hypothesis 1(b)

The longer a consumer's planned product holding time, the higher the consumer's perceived safety risk in the product.

Hypothesis 1(c)

The longer a consumer's planned product holding time, the higher the perceived comfort risk in the product.

Hypothesis 1(d)

The longer a consumer's planned product holding time, the higher the perceived performance risk in the product (In this study an automobile's gas mileage is considered a performance risk factor).

Hypothesis 1(e)

The longer a consumer's planned product holding time, the higher the perceived financial risk in the product.

Hypothesis 1(f)

The longer a consumer's planned product holding time, the higher the perceived social risk in the product.

Hypothesis 1(g)

The longer a consumer's planned product holding time, the higher the perceived resale value risk in the product.

Hypotheses dealing with Risk Acceptance and PPHT

The following category of hypotheses deal with a consumer's acceptance of the specific risk types as they relate to PPHT.

Hypothesis 2(a)

The longer the planned holding time of a product, the less the consumer's acceptance of the risk of durability in the product.

This hypothesis is aimed at investigating the idea that a consumer would least tolerate the possibility that the product may not last long, if the consumer plans to use the product for a long time relative to his perceived useful life of the product.

The following are additional hypotheses relating to a consumer's acceptance of specific risk types.

Hypothesis 2(b)

The longer the planned holding time of a product, the less the consumer's acceptance of the product's perceived safety risk.

Hypothesis 2(c)

The longer the planned holding time of a product, the less the consumer's acceptance of the perceived comfort risk in the product.

Hypothesis 2(d)

The longer the planned holding time of a product, the less the consumer's acceptance of the perceived performance (here, gas mileage) risk in the product.

Hypothesis 2(e)

The longer the planned holding time of a product, the less the consumer's acceptance of the perceived financial risks in the product.

Hypothesis 2(f)

The longer the planned holding time of a product, the less the consumer's acceptance of the perceived social risk in the product.

Hypothesis 2(g)

The longer the planned holding time of a product, the less the consumer's acceptance of the perceived resale value risk in the product.

Hypotheses dealing with the combination of Perceived Risk and Risk Acceptance

This set of hypotheses have two sub-categories: (a) those relating perceived risk and risk acceptance to PPHT and (b) those relating perceived risk to risk acceptance, without any consideration for how long product will be used.

Sub-Category 3:1 Hypotheses

This category of hypotheses is formulated to address the following question: "Does the amount of risk perceived, net of the amount of risk acceptable to a consumer (or what may be termed net risk) vary directly with how long a consumer intends to use a product?". These hypotheses are presented below.

Hypothesis 3:1(a)

The longer a consumer's planned holding time of a product, the higher the overall net risk in the product.

Hypothesis 3:1(b)

The longer a consumer's planned holding time of a product, the higher the net durability risk in the product.

Hypothesis 3:1(c)

The longer a consumer's planned holding time of a product, the higher the net safety risk in the product.

Hypothesis 3:1(d)

The longer a consumer's planned holding time of a product, the higher the net comfort risk in the product.

Hypothesis 3:1(e)

The longer a consumer's planned holding time of a product, the higher the net performance (here, gas mileage) risk in the product.

Hypothesis 3:1(f)

The longer a consumer's planned holding time of a product, the higher the net financial risk in the product.

Hypothesis 3:1(g)

The longer a consumer's planned holding time of a product, the higher the net social risk in the product.

Hypothesis 3:1(h)

The longer a consumer's planned holding time of a product, the higher the net resale value risk in the product.

Sub-Category 3:2 Hypotheses

This category of hypotheses is designed to answer the following question: "Is the amount of risk perceived by a consumer inversely related to the amount of the risk which the consumer is willing to accept?" That is, is high risk perceived by a consumer also less acceptable to him or her, such that one could make a statement that if a consumer perceives a high degree of risk he or she would be less likely

to accept a product because of the risks involved? These hypotheses are classified as sub-category 3:2 hypotheses.

Hypothesis 3:2(a)

The amount of durability risk perceived in a product is inversely related to the amount of durability risk the consumer is willing to accept in the product.

Hypothesis 3:2(b)

The amount of safety risk perceived in a product is inversely related to the amount of safety risk the consumer is willing to accept in the product.

Hypothesis 3:2(c)

The amount of comfort risk perceived in a product is inversely related to the amount of comfort risk the consumer is willing to accept in the product.

Hypothesis 3:2(d)

The amount of performance (here, gas mileage) risk perceived in a product is inversely related to the amount of gas mileage risk the consumer is willing to accept in the product.

Hypothesis 3:2(e)

The amount of financial risk perceived in a product is inversely related to the amount of financial risk the consumer is willing to accept in the product.

Hypothesis 3:2(f)

The amount of social risk perceived in a product is inversely related to the amount of social risk the consumer is willing to accept in the product.

Hypothesis 3:2(g)

The amount of resale value risk perceived in a product is inversely related to the amount of resale value risk the consumer is willing to accept in the product.

Statistical Methodology

The design of the study may be described as quasi-experimental, with the main independent variable of interest (PPHT) manipulated in a field setting. As mentioned earlier in this chapter, each respondent was asked to assume that he will use the product (i.e. the car of his choice) for a specified period (PPHT). Each respondent was presented with only one PPHT and his or her responses to the questions on risk perception and risk acceptance were relative to the assumed PPHT. Five PPHT's were used, namely 1 year,

5 years, 10 years, 12 years, and more than 12 years. From the above manipulation, it was possible to classify each respondent into one of five groups, with each group defined in terms of the PPHT; Group I (PPHT = 1 year), Group II (PPHT = 5 years), Group III (PPHT = 10 years), Group IV (PPHT = 12 years), and Group V (PPHT = more than 12 years).

The research question to be answered with the above design is whether there are any differences in the groups' evaluation of risk and their acceptance of risk elements in the product. Three basic statistical techniques were employed in the analysis, namely One Way Analysis of Variance (ANOVA), Kruskal-Wallis One Way Analysis of Variance, and Covariance Analysis. The difference between the two Analyses of Variance techniques mentioned above is that the Kruskal-Wallis ANOVA is a nonparametric test which assumes ordinal-scaled data while the pure ANOVA is a parametric test which assumes interval-scaled data.

While the Likert-type scaling technique used in the questionnaire is not interval-scaled in the strict statistical sense, the assumption is generally made for such scales to be treated as interval-scaled in social science research (Kerlinger, 1973 p. 438-440). Therefore, the pure ANOVA technique used is not inappropriate. However, the Kruskal-Wallis ANOVA technique was used to provide a more rigorous statistical measure for testing the hypotheses.

As will be demonstrated later, the application of the two techniques was rather useful since the amount of similarity obtained in the results of both methods turned out to reinforce the appropriateness of using either method.

The Analysis of Covariance (ANCOVA) technique is an additional tool used here to eliminate the effect of the following metric variables which were assumed likely to have significant impact on the criterion variables. The specific variables used as covariates are "Perceived Product Useful Life (PPUL)" which was measured for each respondent, and "How long each respondent thought he or she would have kept the car which they had in mind (i.e., expected holding time, EHT)."

The preceding measure of how long each respondent thought they would have kept the car (EHT) was included in the last section of the questionnaire after all responses had been obtained for the manipulated Planned Product Holding Time (PPHT). Since the respondent's estimated holding time was considered likely to have a potentially significant impact on his response, a covariance analysis was performed to determine if the assumption of significant impact would hold by determining the covariate effect. In the same way, each respondent's "Perceived Product Useful Life" was used as a covariate to determine if it had any significant impact on the criterion variable. The following

is a recapitulation of the statistical methodology based on the design of the study.

Step 1: Use of ANOVA (and Kruskal-Wallis ANOVA) techniques to measure differences in groups'mean risk perception, risk acceptance and net risk.

Step 2: Statistically determine if significant differences exist between groups' level of risk perception, risk acceptance, or net risk, and if so which groups are different.

Step 3: Perform Covariance Analysis using "Perceived Product Useful Life" (PPUL) and respondents' own stated "Expected Holding Time" (EHT) as covariates, and then compare these results with those obtained in Step 2 above.

The purpose of the statistical methodology above is to relate the results to the hypothesized relationships. The following chapter (Chapter IV) will examine the results of the analysis as they relate to the hypotheses developed.

CHAPTER IV

RESULTS

The results of the analysis of the study outlined in the preceding chapter are discussed here. The material is organized into the following four main categories:

1) Relevant descriptive sample statistics.
2) Category 1 hypotheses test results: these hypotheses deal with Risk Perception and PPHT.
3) Category 2 hypotheses test results: these hypotheses relate to Risk Acceptance and PPHT.
4) Category 3:1 and 3:2 hypotheses: Category 3:1 relates Perceived Risk and Risk Acceptance to PPHT; Category 3:2 relates Perceived Risk to Risk Acceptance.

Descriptive Sample Statistics

The results presented in this section are designed to provide some basic statistics of interest for the sample as a whole and for the five groups defined in the methodology. The basic demographic data presented in the last chapter will not be reproduced here but should also be taken note of. The first set of descriptive results pertain to the

respondents' ranking of the importance of the risk factors. Respondents were asked to rank the seven risk factors presented in order of their importance to them. The result of this ranking for the total sample as well as breakdown by group for each of the five groups is presented in Table 5.

The above rankings show that "Safety" on the road is considered the most important risk factor in an automobile, as far as the sample of respondents are concerned. The grand mean ranking for safety is 5.97 out of a possible 7 ranking (seven factors ranked in order of importance, with "7" ranking for "most important" and "1" for "least important" factor). This ranking of safety as the most important factor is consistent over the five groups, with each Group ranking safety as the most important factor. The results also demonstrate that social risk (or the prestige element of buying a car), is the least important of the risk factors, but surpassed only slightly by resale value as the next least important factor.

An examination of the group results, however, show that only two out of the five groups consider the social element as the least important, while the remaining three groups rank resale value as the least important, even though the overall mean ranking for resale value is higher than that for social risk. The apparent inconsistency is due to the

TABLE 5

IMPORTANCE FACTOR**	GRAND MEAN	GROUP MEAN RANKINGS OF FACTOR IMPORTANCE*				
		GROUP 1	GR II	GR III	GR IV	GR V
SAFETY	5.97	6.17	6.00	6.11	6.02	5.57
DURABILITY	4.82	4.12	4.84	5.02	5.04	5.07
MILEAGE	4.32	4.49	4.20	4.20	4.39	4.33
COMFORT	4.16	3.84	4.42	4.28	4.00	4.07
PRICE	4.05	4.23	3.64	4.00	4.30	4.10
RESALE VALUE	2.43	3.07	2.38	2.19	2.23	2.28
SOCIAL	2.25	2.09	2.53	2.21	2.04	2.36

Ranking*

7 = Most Important Factor
1 = Least Important Factor

** Ordered from Most Important Factor (Safety Risk) to Least Important Factor (Social Risk).

Difinition of Groups

Group I	(PPHT = 1 Yr)
Group II	(PPHT = 5 Yrs)
Group III	(PPHT = 10 Yrs)
Group IV	(PPHT = 12 Yrs)
Group V	(PPHT = More than 12 Yrs)

significantly higher ranking of resale value by Group 1 relative to all other groups, an interesting phenomenon which will be discussed later in the hypotheses results section.

The next set of summary statistic is the ranking of the acceptability or tolerance of risk factor by respondents (Table 6). The respondents were asked to rank the risk factors in order of their acceptability; that is, how tolerable each risk factor is to the respondent. This phenomenon is worth determining since this tolerance level could make the difference between a purchase and a no purchase decision irrespective of the amount of risk perceived by a consumer. Table 6 presents the results of the rankings of acceptability of the risk factors.

As might be expected based on the previous results of the ranking of the importance of the risk factors, safety risk is ranked as the least acceptable of the risk factors. It would be recalled that safety risk was ranked as the most important risk factor. It is, therefore, not surprising that the presence of safety risk is considered the least acceptable of all the risk elements. The acceptability results are presented in Table 7 together with the importance of ranking results for the purpose of comparison.

TABLE 6

ACCEPTABILITY FACTOR**	GRAND MEAN	GROUP MEAN RANKINGS OF ACCEPTABILITY OF RISK FACTOR*				
		GROUP I	GROUP II	GROUP III	GROUP IV	GROUP V
SAFETY	2.31	2.44	2.30	2.45	2.01	2.28
DURABILITY	3.17	3.83	3.00	3.23	2.90	2.90
COMFORT	3.86	4.00	3.51	3.61	4.24	3.95
MILEAGE	3.88	3.93	3.85	3.94	3.96	3.73
PRICE	4.15	4.02	4.12	4.18	3.97	4.45
RESALE VALUE	5.15	4.43	5.16	5.53	5.32	5.22
SOCIAL	5.40	5.39	5.53	4.95	5.60	5.51

Ranking*

1 = Least Acceptable Risk
7 = Most Acceptable Risk

** Ordered from Least Acceptable or Tolerable Risk Factor (i.e. Safety Risk) to Most Acceptable Risk Factor (i.e. Social Risk)

TABLE 7

	TOTAL SAMPLE MEAN RANKING	
RISK FACTOR	IMPORTANCE RANKING*	ACCEPTABILITY RANKING**
SAFETY	5.97	2.31
DURABILITY	4.82	3.17
MILEAGE	4.32	3.88
COMFORT	4.16	3.86
PRICE	4.05	4.15
RESALE VALUE	2.43	5.15
SOCIAL	2.25	5.40

Ranking Scale

Importance*	Acceptability**
7 = Most Important Factor	1 = Least Acceptable Risk
1 = Least Important Factor	7 = Most Acceptable Risk

The above result show that safety risk which is ranked the most important factor is also the least acceptable to the respondents. It also shows that social risk, the least important risk factor is also the most acceptable risk element. In fact, the same order holds true for all the risk factors, except gas mileage and comfort risk which reverse their positions on their acceptability ranking, and even then with only a very narrow difference in ranking (3.88 for gas mileage versus 3.86 for comfort risk).

Category 1 Hypotheses Results:

Risk Perception and PPHT

This set of hypotheses deals with a consumer's risk perception relative to product holding time. In general, the hypotheses are based on the statement that the longer the planned or expected holding time of a product, the higher the perceived risks. The risks measured are the overall risk that a consumer perceives in the purchase and use of an automobile, as well as specific risks regarding safety on the road, durability of the product, social approval, comfort provided by the product, gas mileage, price of the product as well as resale value considerations. The different planned product holding times measured were 1 year, 5 years, 10 years, 12 years, and more than 12 years.

The importance as well as the likelihood of the risk occurring were determined for each respondent. Each risk factor was measured in three ways:

1) Composite measure, which defines risk as the importance of the risk element times the likelihood of the risk occurring.
2) Importance measure, which uses the importance rating of the risk factor as the measure of the level of risk.

3) Likelihood measure, which defines risk in terms of the respondents' rating of the likelihood of the risk occurring.

As pointed out in the literature review section (Chapter II), there is no singularly acceptable measure of risk in the perceived risk literature. Therefore, the approach used in this research is to employ three commonly used measures of perceived risk, namely the "composite" measure, the "importance" measure and the "likelihood" measure. It is believed that using all three measures will provide greater insight into the risk measurement methodology. Furthermore, this approach provides, by implication, a basis for comparing all three measures of risk without the assumption of one method being superior to any other.

The following sections present the results of the statistical tests of the Category 1 hypotheses, using the different definitions of risk indicated above. The results of the composite risk measure are presented first (Table 8).

Category 1 Hypotheses Results using "Composite" Measure of Risk

Each risk element was first defined as the importance the consumer attaches to the risk element times the likelihood he or she places on the risk element occurring. That is, the higher the importance element, the higher the risk, assuming the likelihood remains at least constant, and vice versa. As outlined in the hypotheses section, the overall risk as well as each risk element is examined individually in accordance with the hypothesized relationship. The specific risks examined are durability of the product, social approval, safety on the road, gas mileage, financial worth (price), comfort provided by the car, and resale value.

It was hypothesized that the amount or level of each of these risks that is perceived by a consumer will increase with planned holding time of the product (PPHT), such that if a consumer plans to use the product for a long time he would perceive higher risks than if he plans to use it for a short time. Two statistical tests were performed, namely a One-Way Analysis of Variance (ANOVA), a parametric procedure

TABLE 8

CATEGORY 1 HYPOTHESES TEST RESULTS
COMPOSITE MEASURE OF RISK
(i.e. IMPORTANCE X LIKELIHOOD)

Risk Elements	Risk Measurement	Independent Variable	(NonParametric) Kruskal-Wallis Signif of H*	(Parametric) ANOVA Signif of F*
DURABILITY	Importance X Likelihood of Durability	PPHT	.004	.004
SOCIAL	Importance X Likelihood of Social Approval	"	.283	.061
SAFETY	" " " " Safety	"	.243	.347
MILEAGE	" " " " Gas Mileage	"	.089	.056
PRICE	" " " " Price	"	.379	.303
RESALE VALUE	" " " " Resale Value	"	.428	.545
COMFORT	" " " " Comfort	"	.092	.190
OVERALL	" " " " Overall Risk	"	.510	.595
(RISK ELEMENTS)	Sum of Importance X Likelihood of Risk Elmts	"	.452	.531

* ANOVA and K-W tests are performed for each risk element (i.e. durability, etc).

The summary results here show only the p values of the tests, indicating the significance level of differences in group means.

which assumes at least an interval-scaled data, and a Kruskal-Wallis One Way Analysis of Variance, a non-parametric procedure which assumes ranked data instead of interval-scaled data. All statistical tests were performed by use of the Statistical Package for the Social Sciences (SPSS), Second Edition (1975) and the SPSS Update 7-9, (1981).

Overall, the two test procedures have very similar results as shown in the table of results. The results from the composite measure indicates that of all the risk elements examined, only durability risk scores show a significant difference at the .05 level. The same holds true in both the ANOVA and the Kruskal-Wallis (K-W) tests. Social risk and gas mileage risk, however, show statistically significant difference at alpha = .10, using the ANOVA measure, while comfort and gas mileage, but not social risk show significant differences at the alpha = .10 for the K-W test.

An 'a posteriori' comparison was performed using Tukey test for post ANOVA comparison of significant F results. This procedure was used to test pairwise for groups which are significantly different at the .05 level. The Tukey test results for the ANOVA show that for the durability risk results, Group I is significantly different from Group II at the .05 level, and no other groups are different from each

other. Tukey test results for social risk show that Groups I and IV are significantly different at .05 level.

A simple Multiple Classification Analysis was performed as presented in Table 9. This analysis was run to help in examining the pattern of results. The Table presents the various risk elements, the ANOVA F significance level results, the grand mean scores of each risk factor and the deviations of the scores of each risk factor by group. A negative score of say -2 indicates that the group's mean score for that risk factor is less than the grand mean for the total sample by the value indicated, in this example, the value of 2. A positive score means the group mean score is greater than the grand mean by the specified value.

The MCA Table helps in examining the "pattern" of results, a phenomenon which is not easy to visualize from a multiple pairwise comparison test such as the Tukey test results. The MCA results show that among the risk factors with significant differences (at least at .10 level) only social risk provides a reasonably good confirmation of the hypothesis, i.e. the longer PPHT groups tend to perceive higher social risk than the shorter PPHT groups.

Among the risk factors with non-significant differences, comfort risk displays a pattern which seems consistent with the hypothesis, i.e. the longer PPHT groups perceive higher comfort risks than the shorter PPHT groups,

TABLE 9

ANOVA RESULTS WITH MCA USING COMPOSITE MEASURE OF RISK

COMPOSITE RISK MEASURE (LXI)	INDEP. VAR.	ANOVA SIGNIF OF F	MULTIPLE CLASSIFICATION ANALYSIS (MCA)					
			GRAND MEAN	ADJUSTED DEV. FROM MEAN				
				GR I	GR II	GR III	GR IV	GR V
DURABILITY	PPHT	.044	45.26	-6.62	7.01	3.66	-0.85	-3.22
SOCIAL	PPHT	.061	8.00	-2.38	-1.14	-0.51	3.54	0.55
SAFETY	PPHT	.347	31.17	0.52	-0.94	-2.40	5.19	-2.17
MILEAGE	PPHT	.056	30.42	0.91	-4.90	1.30	-1.17	3.83
PRICE	PPHT	.303	35.04	2.99	-3.99	-2.32	3.33	0.14
RESALE VALUE	PPHT	.545	25.74	2.72	-0.32	-0.71	1.19	-2.72
COMFORT	PPHT	.190	24.75	-1.50	-3.40	-1.14	2.89	3.13
OVERALL RISK	PPHT	.595	29.67	3.21	-1.87	-0.41	1.03	-1.79
(COMPOSITE) RISK	PPHT	.531	200.39	-3.35	-7.69	-2.12	14.12	-0.47

even though one could say that this may be due to chance. Overall, 5-year and 10-year PPHT groups (Groups II and III) tend to perceive less risk than the 12-year and more than 12-year groups (Groups IV and V), except for durability risk where the 5- and 10-year groups perceive much higher risk.

Durability risk scores show a "curvilinear pattern", where Group I (the 1-year group) risk perception is low, increases for Group II and then decreases consistently for Groups III, IV and V respectively. The 1-year group (Group I) has a pattern that is not always consistent with the hypotheses. For example, Group I has a higher resale value risk score than all other groups, a result which is the reverse of the hypothesized relationship, an interesting phenomenon which will be examined in the following section.

Category 1 Hypotheses Results Using "Importance" Measure of Risk

The generally used measure of perceived risk is the composite definition outlined in the preceding section (Cunningham, 1967; Ross, 1975). It assumes that perceived risk is a multiplicative function of the importance attached to risk element and the likelihood of the risk occurring. In addition to the above definition the approach taken in this research is to examine not only the multiplicative functional definition, but also to look at the two com-

ponents separately as possible determinants of risk and then test the hypotheses accordingly.

This approach was also deemed necessary, because from the design of the study, each respondent was given the choice of determining what type of automobile they would buy, and hence it is possible that the choices made might consciously or subconsciously be geared towards minimizing the likelihood of the risk occurring. In such a situation, the scores for likelihood of the risk occurring would tend to be low for most respondents. Additional insight could, therefore, be gained from using both the importance and the likelihood measures of risk separately, particularly the importance measure as the definition of perceived risk.

The results of the test for Category 1 Hypotheses using the "importance" measure of risk definition are displayed in Table 10. Again, both a parametric procedure (ANOVA) and a non-parametric procedure (Kruskal-Wallis ANOVA) were used. The ANOVA results show that the group means for durability risk and resale value risk are significantly different at the point .05 level ($p < .000$ and .044 respectively), and gas mileage risk shows significant difference at the .10 level ($p < .073$). Similar results are obtained for the K-W tests except for the gas mileage risk which shows no significant difference ($p < .173$). When "the sum of the importance of all the risk components" is examined, both test

TABLE 10

CATEGORY 1 HYPOTHESES TEST RESULTS USING "IMPORTANTCE" MEASURE OF RISK
(IMPORTANCE OF RISK ELEMENT)

Risk Element	Risk Measurement	Independent Var.	NonParametric Kruskal-Wallis Signif. of H	Parametric ANOVA Signif of F
DURABILITY	Importance of Durability	PPHT	.000	.000
SOCIAL	Importance of Social Approval	"	.257	.135
SAFETY	" " " Safety	"	.822	.657
MILEAGE	" " " Gas Mileage	"	.174	.073
PRICE	" " " Price	"	.929	.731
RESALE VALUE	" " " Resale Value	"	.009	.044
COMFORT	" " " Comfort	"	.157	.187
OVERALL RISK	" " " Overall Risk	"	.370	.791
(OF RISK ELEMENT)	Sum of Importance of Risk Elments	"	.003	.019

procedures show a highly significant difference in the group means ($p < .003$ for K-W test and $p < .019$ for the ANOVA test).

An 'a posteriori' comparison was again performed using Tukey test for post ANOVA comparison of significant F results. The procedure was used to test pairwise for groups which are significantly different at the .05 level. The results show that for durability risk, Group I is significantly different from all the other four groups (Groups II, III, IV, and V) at the .05 level. For resale value risk, the results indicate there is a significant difference between Group I and Group IV at the .05 level. The Tukey test for "the sum of the importance of all risk components" shows that Group I and Group IV means are significantly different at the .05 level.

The MCA provides information for examining the pattern of results (Table 11). For durability and gas mileage risks which have significant F values ($p < .000$ for durability and $p < .073$ for gas mileage) there is a clear pattern to confirm the hypothesis that shorter PPHT groups perceive lower risk than longer PPHT groups, particularly for durability risk. The gas mileage risk results also indicate that those who intend to keep the car longer (i.e. 10 years and over) are more concerned with gas mileage than those who intend to keep the car for a shorter period (1 year and 5 years).

TABLE 11

IMPORTANCE MEASURE OF RISK
ANOVA RESULTS WITH MCA

RISK ELEMENTS	INDEP. VAR.	ANOVA SIGNIF OF F	MULTIPLE CLASSIFICATION ANALYSIS (MCA)					
			GRAND MEAN	ADJUSTED DEV. FROM MEAN				
				GR I	GR II	GR III	GR IV	GR V
IMPORTANCE OF DURABILITY	PPHT	.000	7.55	-1.53	0.13	0.36	0.36	0.65
" " SOCIAL APPROVAL	PPHT	.135	2.67	-0.58	-0.12	0.24	0.07	0.38
" " SAFETY	PPHT	.657	8.41	-0.07	-0.21	0.04	0.13	0.11
" " MILEAGE	PPHT	.073	7.06	-0.26	-0.46	0.35	0.10	0.29
" " PRICE	PPHT	.731	7.91	-0.22	0.01	-0.09	0.16	0.14
" " RESALE	PPHT	.044	6.67	0.66	0.17	-0.12	-0.42	-0.29
" " COMFORT	PPHT	.187	7.52	-0.25	0.03	0.14	-0.26	0.31
" " OVERALL RISK	PPHT	.791	8.20	-0.06	0.13	-0.06	-0.08	0.06

1 = Extremely Unimportant (Low Risk)

9 = Extremely Important (High Risk)

Resale value risk, which also has signifcant F value ($p < .044$) shows a reverse pattern, contrary to the hypothesized relationship; that is, resale value risk decreases as PPHT increases, indicating that those who intend to keep the car for a short time are more concerned with the resale value of the car than those who intend to keep it for a longer period.

This again, may be explained by the assumption that consumers would tend to worry less about resale value once the car has been kept for a long time, a phenomenon which could be attributed to auto industry reports which indicate that automobile depreciation rates are rather high in the initial years (particularly in the first year) and stabilize somewhat thereafter.

For those risk factors which do not show statistically significant differences between groups, there is still some "pattern" demonstrated in the MCA Table to suggest the possibility that longer PPHT is associated with higher risk perception. This pattern holds for both social risk and safety risk: group means for the shorter PPHT groups are less than the grand mean while the group means for the longer PPHT groups are greater than the grand mean.

However, since the F values for the above risk factors are not significant, it could only be said that further investigation is probably worthwhile for these risk components.

Category 1 Hypotheses:

Analysis of Covariance Results

Since it is not possible to incorporate in a research design all possible factors which might affect a criterion variable, it is likely that some factors not accounted for may have significant impact on the results obtained. Analysis of covariance is a technique which is designed to address this problem. Analysis of covariance can be used to control for "disturbing" or "pre-existing" variables which are not controlled for by the experimental design. The SPSS MANOVA program can perform an analysis of covariance in which interval-scaled independent variables (covariates) are used in conjuction with categorical variables (factors).

In the present study, two interval-scaled variables which were considered possible "disturbing" variables were used one at a time as covariates in a one-way analysis of covariance model. These disturbing variables are: (1) the individual respondents' own estimate of how long they expect to use the car they had in mind if they bought it and (2) perceived product useful life. It should be recalled

that respondents' evaluation of the risks perceived and risk acceptance were based on a manipulated holding time of the car. Since the individuals' own assessment of how long they think they might use the car could influence their response, this expected holding time (labelled as EHT) is used as a covariate in the covariance analysis. (EHT refers to Expected Holding Time of the product, as indicated by the individual, as opposed to PPHT, which refers to the experimentally manipulated product holding time, i.e. Planned Product Holding Time.)

The second covariance analysis employs Perceived Product Useful Life (PPUL) as the covariate. This variable was also considered an important "disturbing" factor since the experimental design was such that despite the definition of PPHT relative to perceived product useful life, the assignment of respondents into PPHT groups was random, and not based on the individual's own PPUL. It should be recalled that the PPUL, on which the PPHTs were defined for creating the five groups, was determined from a pilot study as explained in Chapter III. Therefore, it was necessary to assess the impact of the individual respondent's own estimate of the useful life of a car on the analysis results by using PPUL as a covariate in the analysis of covariance.

Covariance Analysis Assumptions

The introduction of covariates into the analyses is made to determine or statistically adjust for the effect of the covariates on the dependent variables. There are, however, two basic assumptions which need to be considered in the interpretation of the covariance results. These assumptions are: 1) that there is a relationship (generally linear) between the dependent variable and the covariate, and 2) that the effect of the covariate on the dependent variable is the same or homogeneous across all treatment groups or levels.

The first assumption above, therefore, implies that the coefficient of the covariate is non-zero. If this assumption does not hold, "there would be no benefit to complicating the analysis by the inclusion of the covariate." (Wildt and Ahtola, 1978 p.28).

The second assumption relating to the interaction between the covariate and the treatment effect is even more important, because if interaction exists, the covariance analysis may provide misleading results. Since interaction means that there is some correlation between the covariate and the treatment or factor, the removal of the covariate effect through a covariance analysis would remove some of the effect of the treatment on the response (or dependent) variable.

Tests of Treatment by Covariate Interaction

Two tests were performed separately for (1) treatment (PPHT) by covariate (EHT) interaction and (2) treatment (PPHT) by covariate (PPUL) interaction. These tests were performed using the general linear regression method with dummy variables created for the treatment levels. The SPSS regression program was employed for this test.

A summary of the test results is presented in Appendix IIIA. The results showed that (1) there is no interaction between PPHT and EHT (at alpha .05); (2) there is significant interaction between PPHT and PPUL (at alpha .05). The above results suggest that while the covariate EHT may be controlled for, controlling for PPUL might result in removal of some of the treatment (PPHT) effect on the response variables. Therefore, the covariance analysis employing PPUL as covariate was eliminated from the discussion of results and only covariate EHT results are presented.

Testing Covariate Coefficient (B)

Statistical tests were performed in this study to determine if the coefficient of the covariate EHT is non-zero for all the dependent variables. The tests involved the determination of the covariate coefficients and their

statistical significance, as well as a confidence interval estimate of the coefficients. A summary of the test results is presented in Appendix IIIB. The results generally indicate that some of the coefficients are not significant, i.e. they may be assumed to be zero. There are instances, however, where the results indicate significance of the coefficients.

Covariance Results with "Composite"Measure of Risk

The results of the analysis of covariance are presented in Table 12. These results are presented together with the previous analysis of variance results for the composite measure of risk. The analysis of covariance (ANCOVA) p values are the significance levels or probabilities of F values for the treatment effect on the criterion variables after removing the covariate EHT effect.

Results with Covariate "EHT"

The ANCOVA results for EHT show that for those risk factors which have significant ANOVA F values with $p < .10$, there appears to be some amount of covariate effect; however, the effect is not usually significant. The p value for durability risk is $p < .004$ for ANOVA and $p < .003$ for

the ANCOVA. The covariance coefficient (B) of the durability risk is, however, not significantly different from zero.

The ANCOVA results for Social risk show that when the covariate effect is removed, a significant difference is observed in the group means ($F=3.03$, $p < .018$). Without removing the covariate effect, no difference was obtained for Social risk. It should be pointed out that for the composite measure of risk, only Social risk has a non-zero covariance coefficient. Therefore, strickly speaking Social risk is the only risk criterion variable which statistically necessitates the covariance analysis.

The p value for gas mileage risk, however, increased with the covariate effect from $p < .056$ to $p < .064$. The latter implies that the inclusion of the covariate EHT has made the test of PPHT-induced differences in the response variable (gas mileage) more sensitive, with the result that even smaller differences are detected in the group means. For those risk factors which did not show any significant differences in the groups for the ANOVA results ($p < .10$), there were no significant changes after removing the covariate effect. Overall, the analysis of covariance results for the "Composite" measure of risk did not indicate any significant impact of the covariate EHT, except for social risk as explained above. The above results are consistent

TABLE 12

ANALYSIS OF COVARIANCE RESULTS
WITH "COMPOSITE" MEASURE OF RISK

COMPOSITE RISK MEASURE	INDEP. VAR.	K-W SIGN. OF H	ANOVA SIGN. OF F	COVARIANCE ANALYSIS WITH EHT AS COVARIATE: ANCOVA SIGN. OF F*
DURABILITY	PPHT	.004	.004	.003
SOCIAL	"	.283	.061	.018
SAFETY	"	.243	.347	.265
MILEAGE	"	.089	.056	.064
PRICE	"	.379	.303	.259
RESALE	"	.428	.545	.563
COMFORT	"	.092	.190	.153
OVERALL	"	.510	.595	.598
(COMPOSITE) RISK	"	.452	.531	.450

* This column show the significant level or p values for the F test of PPHT after removing the covariate (EHT) effect.

with the fact that only Social risk (PROSOCIAL) has a statistically significant covariate EHT coefficient as shown in Appendix IIIB (with Beta coefficient of -1.46 and unstandardized B of -1.34 and $p < .013$).

Covariance Result with "Importance" Measure of Risk

The covariance analysis results for the risk elements using the importance of risk definition for risk shows a somewhat different pattern from the results for the composite risk measure.

Results with Covariate "EHT"

The ANCOVA results for EHT (Table 13) again show a significant change for social risk, with $p < .135$ for ANOVA to $p < .041$ for ANCOVA , reflecting a significant covariance effect (B is significant at .001). Therefore, by removing EHT effect, a statistically significant difference is obtained in the groups' evaluation of social risk, a finding that is different from the ANOVA test result.

For safety risk, however, the p value for the F ratio changes from $p < .057$ to $p < .873$ (with B significant at .005 level). The safety risk results imply that there is a signifcant EHT impact on the original differences observed in the groups. Those differences, therefore, are probably

TABLE 13

ANALYSIS OF COVARIANCE RESULTS
WITH "IMPORTANCE" MEASURE OF RISK

RISK ELEMENT	INDEP. VAR.	K-W SIGN. OF H	ANOVA SIGN. OF F	COVARIANCE ANALYSIS WITH EHT AS COVARIATE: ANCOVA SIGN. OF F
DURABILITY	PPHT	.000	.000	.000
SOCIAL	"	.257	.135	.041
SAFETY	"	.822	.057	.873
MILEAGE	"	.174	.073	.164
PRICE	"	.929	.731	.871
RESALE	"	.009	.044	.086
COMFORT	"	.157	.187	.187
OVERALL RISK	"	.370	.791	.783
(IMPORTANCE) RISK	"	.003	.019	.034

not due to Product Holding Time (PPHT) but more likely to the respondents' Expected Holding Time (EHT) of the product. It is worth noting that the p value for the Kruskal-Wallis test results for safety risk is $p < .822$, a value rather similar to the ANCOVA p value ($p < .873$) above.

For the other risk factors with $p < .10$, the ANCOVA results show that the introduction of the covariate (EHT) leads to more sensitive results with less differences being detected in the PPHT effect in the groups (gas mileage risk from $p < .073$ to $p < .164$; resale value risk from $p < .044$ to $p < .086$; and sum of importance of all risk elements from $p < .019$ to $p < .034$; however, only mileage risk has a significant B among the above three risk factors).

Category 1 Hypotheses

Results Using "Likelihood" Measure of Risk

The preceding sections dealt with the results of the hypotheses test using both the "composite" and the "importance" measures of risk. The following presents the test results using "likelihood" measure of risk.

The "likelihood" measure of risk refers to the rating by respondents of the likelihood of a risk element occurring. It assumes that if a respondent considers a risk element "extremely likely" to occur, it implies a high risk

perception, and vice versa. The ANOVA results, as shown in Table 14 indicate that durability risk and social risk have significant F, $p < .000$ for durability and $p < .007$ for social risk. The K-W test results, however, show a significant difference for durability risk only ($p < .000$). An "a posteriori" Tukey test of comparison for the significant ANOVA results indicate that for durability risk, Groups I and II are signficantly different at the .05 level, while for social risk Groups II and III are different from Group IV at the .05 level.

An examination of the MCA results (Table 15) reveals a consistent pattern confirming the hypotheses for durability risk; that is, the longer the product holding time, the higher the durability risk. A similar pattern holds true for social risk, except for Group V whose social risk rating is less than the rating by Group IV.

It should be pointed out that "likelihood" ratings of risk elements are generally low for the total sample, with the highest grand mean rating of only 4.49 on the 9-point scale for financial worth (price risk) while the "importance" rating of risk factors has a mean rating of no less than 6.67 (on the 9-point scale) for each risk element except social risk, and mean risk ratings go as high as 8.41 for safety risk.

TABLE 14

CATEGORY 1 HYPOTHESES TEST RESULTS USING "LIKELIHOOD" MEASURE OF RISK

Risk Element	Risk Measurement	Independent Var.	(NonParametric) Kruskal-Wallis Signif. of H	(Parametric) ANOVA Signif of F
DURABILITY	Likelihood of Durability	PPHT	.000	.000
SOCIAL	Likelihood of Social Approval	"	.122	.007
SAFETY	" " " Safety	"	.277	.312
MILEAGE	" " Gas Mileage	"	.260	.340
PRICE	" " " Price	"	.434	.442
RESALE VALUE	" " " Resale Value	"	.319	.411
COMFORT	" " " Comfort	"	.100	.137
OVERALL RISK	" " " Overall Risk	"	--	.432
(OF RISK ELEMENT)	Sum of Likelihood of Risk Elements	"	.136	.131

TABLE 15

LIKELIHOOD MEASURE OF RISK
ANOVA RESULTS WITH MCA

RISK ELEMENT	INDEP. VAR.	ANOVA SIGNIF OF F	MULTIPLE CLASSIFICATION ANALYSIS (MCA)					
			GRAND MEAN	ADJUSTED DEV. FROM MEAN				
				GR I	GR II	GR III	GR IV	GR V
LIKELIHOOD OF DURABILITY	PPHT	.000	3.94	-0.80	-0.71	0.04	0.50	0.95
" " SOCIAL APPROVAL	PPHT	.007	2.65	-0.17	-0.37	-0.53	0.84	0.22
" " SAFETY	PPHT	.312	3.71	0.03	-0.05	-0.31	0.60	-0.25
" " MILEAGE	PPHT	.340	4.41	0.25	-0.26	-0.08	-0.27	0.34
" " PRICE	PPHT	.442	4.49	0.39	-0.44	-0.16	0.25	-0.02
" " RESALE	PPHT	.411	3.99	-0.04	-0.24	-0.17	0.55	-0.09
" " COMFORT	PPHT	.137	3.36	-0.17	-0.35	-0.27	0.57	0.23
" " OVERALL RISK	PPHT	.432	3.67	0.44	0.28	-0.03	0.14	-0.24

1 = Extremely Unlikely (Low Risk)

9 = Extremely Likely (High Risk)

Category 2 Hypotheses Results: Risk Acceptance and PPHT

These set of hypotheses deal with a consumer's acceptance of the specific risks in a product. It is hypothesized that a consumer will be less likely to accept or tolerate the risks which he perceives in a product if he plans to use it for a long time rather than a short time. In this research, therefore, the acceptability of the risks investigated are measured for all five PPHT groups. The results are summarized in Table 16, showing a parametric ANOVA test, as well as a non-parametric Kruskal-Wallis test.

The results indicate that there are significant differences in group means for three of the seven risk factors, namely durability risk, social risk and resale value risk. Both the ANOVA and the K-W procedures have similar results. For durability risk, the test shows a significant difference ($p < .003$ for the ANOVA and $p < .017$ for the K-W). Tukey test results indicate that Group I is significantly different from Groups II, III and V at the .05 level.

Both social risk and resale value risk also show significant differences ($p < .050$) for the ANOVA test and for the K-W test ($p < .040$). A Tukey test for post-ANOVA comparison for social risk indicates that Groups II and III are significantly different from each other. Resale value risk has

TABLE 16

CATEGORY 2 HYPOTHESES TEST RESULTS
RISK ACCEPTABILITY

Risk Element	Risk Acceptability Measurement	Independent Var.	Non-Parametric Kruskal-Wallis Signif. of H	Parametric ANOVA Signif of F
DURABILITY	Acceptability of Durability Risk	PPHT	.017	.003
SOCIAL	" " Social "	"	.040	.050
SAFETY	" " Safety "	"	.227	.175
GAS MILEAGE	" " Mileage "	"	.397	.390
PRICE	" " Price "	"	.688	.543
RESALE VALUE	" " Resale Value "	"	.002	.001
COMFORT	" " Comfort "	"	.136	.166

significant difference in group means ($p < .001$ for ANOVA and $p < .002$ for K-W) with Tukey test results for resale value risk showing that Group I is different from Groups III and IV at the .05 level.

Multiple Classification Analysis results (Table 17) do not show any clear pattern to confirm the hypotheses that longer PPHT groups are less tolerant of the risk elements than shorter, PPHT groups. However, two interesting patterns emerged for (1) resale value risk and (2) the longest (12 + years) PPHT group. Resale value shows a relatively consistent pattern in the reverse of the hypothesized relationship. The results indicate that the shorter the PPHT the less acceptable the resale value risk. (This result is consistent with the pattern for risk perception, where resale value risk is highest for shorter PPHT groups.) The other interesting pattern relates to Group V, the longest PPHT group. The MCA Table results show that risk tolerance for Group V is <u>lower than average</u> for all risk factors except for resale value (the resale value exception due to the reverse pattern explained above), a phenomenon which lends some credence to the hypotheses of lower tolerance of the risk factors the longer the PPHT. No other group exhibits the same pattern as Group V.

TABLE 17

RISK ACCEPTABILITY
ANOVA RESULTS WITH MCA

RISK ACCEPTABILITY	INDEP. VAR.	ANOVA SIGNIF OF F	MULTIPLE CLASSIFICATION ANALYSIS (MCA)					
			GRAND MEAN	ADJUSTED DEV. FROM MEAN				
				GR I	GR II	GR III	GR IV	GR V
ACCEPTABILITY OF DURABILITY RISK	PPHT	.003	3.03	0.92	-0.45	-0.24	0.16	-0.36
" SOCIAL RISK	"	.050	6.10	0.12	0.61	-0.72	0.21	-0.25
" " SAFETY "	"	.175	2.03	-0.28	-0.02	0.07	0.44	-0.20
" " MILEAGE "	"	.390	3.73	0.01	0.32	-0.01	0.01	-0.32
" " PRICE "	"	.543	3.27	0.04	0.10	0.06	0.22	-0.40
" " RESALE "	"	.001	4.43	-0.85	-0.27	0.25	0.72	0.16
" " COMFORT "	"	.166	3.34	0.07	-0.39	-0.01	0.40	-0.05

1 = Extremely Unacceptable (Low Tolerance of Risk)

9 = Extremely Acceptable (High Tolerance Risk)

Analysis of Covariance Results

One covariate was introduced into the preceding analysis to determine if it had any "disturbing" effects on the results. The covariate used is the same as that used for the Hypotheses 1 results, namely EHT. The results of this covariance analysis is presented in Table 18, together with the ANOVA and K-W results for the purposes of comparison. An examination of the covariance results indicate that there are no significant changes from the p values before the introduction of the covariates, suggesting that the variable EHT has no significant disturbing effects on the ANOVA results relating to risk acceptance and product holding time as discussed in the preceding section. An exception is safety risk acceptability which shows greater differences in groups when the effect of EHT is removed from the PPHT-induced differences. The latter shows that when EHT is controlled for, greater differences are observed in safety risk acceptability as it relates to product holding time. However, this difference is only significant at .10 alpha level, but not significant at .05 level.

Category 3:1 Hypothese Results: Perceived Risk and Risk Acceptance Versus PPHT

The hypotheses tested under this section are designed to address the question as to whether the amount of risk

TABLE 18

ANALYSIS OF COVARIANCE RESULTS FOR RISK ACCEPTABILITY

RISK ELEMENT	INDEP. VAR.	K-W SIGNIF OF H	ANOVA SIGNIF OF F	COVARIANCE RESULTS WITH EHT AS COVARIATE: ANCOVA SIGNIF OF F
DURABILITY RISK	PPHT	.017	.003	.004
SOCIAL "	"	.040	.050	.026
SAFETY "	"	.227	.175	.089
MILEAGE "	"	.397	.390	.475
PRICE "	"	.668	.543	.531
RESALE VALUE"	"	.002	.001	.003
COMFORT "	"	.136	.166	.103

perceived, less the amount of the risk that is acceptable to the consumer vary directly with how long the consumer plans to use the product. The notion of a tolerable level of risk by the consumer is assumed here since consumers may not react to product offerings solely based on the level of risk they perceive but also how much of that risk they might be willing to tolerate.

The difference between each respondent's level of a risk perceived and the amount of that risk which is acceptable is labeled as net risk in this study. The composite measure of risk (i.e. the likelihood x importance) which is the most commonly used measure of risk in the risk literatue is used here to define risk perception. The amount of risk which is acceptable to the consumer is measured by the degree of acceptability of that risk factor.

The results of the hypotheses tests for the net risk factors relative to PPHT are presented in Table 19. The Table shows the results using ANOVA and Kruskal-Wallis procedures. It also provides an MCA summary showing the deviation of each group from the grand mean.

The ANOVA results indicate that only two of the net risk factors, namely, net durability risk and net mileage risk have significant differences in group means at the .05 level or better ($p < .002$ and $p < .036$ for net durability and mileage risks respectively). Net social risk shows significance at $p < .085$.

TABLE 19

NET RISK
ANOVA, K-W, AND MCA RESULTS

NET RISK	INDEP VAR	K-W SIG. OF H	ANOVA SIGNIF. OF F	MULTIPLE CLASSIFICATION ANALYSIS (MCA) ADJUSTED GRAND MEAN	DEVIATION FROM MEAN GR I	GR II	GR III	GR IV	GR V
NET DURABILITY RISK	PPHT	.002	.002	42.23	-7.54	7.46	3.90	-1.01	-2.86
" SOCIAL "	"	.091	.085	1.90	-2.50	-1.75	0.20	3.33	0.80
" SAFETY "	"	.309	.414	29.14	0.79	-0.92	-2.47	4.75	-1.98
" MILEAGE "	"	.066	.036	26.69	0.90	-5.22	1.31	-1.18	4.15
" PRICE "	"	.368	.309	31.77	2.95	-4.09	-2.39	-3.11	0.54
" RESALE "	"	.457	.421	21.31	3.57	-0.06	-0.96	0.46	-2.88
" COMFORT "	"	.127	.242	21.41	-1.57	-3.01	-1.13	2.50	3.18
" OVERALL "	"	.578	.633	25.97	3.20	-1.86	-0.32	0.72	-1.58

Net Risk = Composite Risk Less Acceptability of Risk

From the K-W results, only net durability risk shows a highly significant difference in group means ($p < .002$). Net mileage risk has significant difference at $p < .066$ and net social risk is significant at $p < .091$, both based on the K-W test prodcedures.

A Tukey test was performed for the significant results of the ANOVA. The test shows that for the net durability results Group I is significantly different from Groups II and III at the .05 level. For net mileage risk the Tukey test shows that Group III is significantly different from Group V.

Analysis of Covariance Results

A covariance analysis (ANCOVA) was performed for the net risk factors using EHT as the covariate. This analysis, as previously explained was done to determine if this variable has any significant 'disturbing' effect on the ANOVA results. The results are summarized in Table 20, together with the ANOVA results.

The covariance analysis results indicate that except for social risk, the covariate EHT did not significantly affect the results. In the case of social risk, the ANCOVA results show that the covariate EHT has a significant effect (B is signficant at .003 level). This is evident from the

TABLE 20

ANALYSIS OF COVARIANCE RESULTS FOR NET RISK

RISK ELEMENT	INDEP. VAR. CPPH	K-W SIGNIF OF H	ANOVA SIGNIF OF F	COVARIANCE RESULTS WITH EHT AS COVARIATE: ANCOVA SIGNIF OF F
NET DURABILITY RISK	PPHT	.002	.002	.002
" SOCIAL "	"	.091	.085	.020
" SAFETY "	"	.309	.414	.338
" MILEAGE "	"	.066	.036	.042
" PRICE "	"	.368	.309	.269
" RESALE VALUE"	"	.457	.421	.468
" COMFORT "	"	.127	.242	.199
" OVERALL "	"	.578	.633	.641

Net Risk = Composite Risk Less Risk Acceptability

significant change in the p value of the F ratio from $p < .085$ to $p < .020$. It can, therefore, be inferred that for net social risk, how long a respondent indicates he or she would like to use the product has an effect on the net social risk score obtained in the study. This implies that for net social risk, the relatively non-significant difference results obtained ($p < .085$) were affected by the covariate and that a significant difference in group means would have been observed if the covariate (EHT) had not impacted the responses.

Category 3.2 Hypotheses Results: Perceived Risk Versus Risk Acceptance

This section deals with hypotheses designed to answer the following question: "Is the amount of the risk perceived by a consumer inversely related to the acceptability of the risk factor?" The issue involves the assumption that a consumer who perceives a high level of safety risk, for example, is also likely to be less tolerant of the safety risk. Conversely, a low risk perceived is also more tolerable to the consumer. These hypotheses are of interest because the idea has been proposed (Rethans 1980) that consumption decisions involving risk evaluations need to consider the risk acceptability factor, since decisions made in high risk perceived risk situations would tend to be af-

fected by the amount of the risk that the consumer considers acceptable. The hypotheses presented in this section, therefore, attempts to determine if consumers' risk acceptance levels could be high even for those risks which are perceived to be high.

The results of the hypotheses tests for the various risk factors are presented in Table 21. The analysis involves determining the rank-order correlation scores for each risk factor over the total sample. Each risk factor is defined in three ways as presented in the beginning of this chapter; that is, "composite" measure, "importance" measure, and a "likelihood" measure. Both Kendall's tau and Spearman's rho correlation coefficients are calculated using the SPSS's program, and the statistical significance of the coefficients are determined.

Kendall and Spearman rank-order correlations are used instead of Pearson product-moment correlation because the risk perception and acceptability ratings are treated as ordinal-scaled variables. Pearson correlation assumes interval-scaled variables. It has, however, been stated that the Spearman's rho seems to yield a close approximation to the Pearson product-moment correlation when the data is relatively continuous, that is, if not characterized by a large number of ties at each rank while Kendall coefficients

are assumed to be somewhat more meaningful when the data contain a large number of ties (Nie et al, SPSS Pg 289).

Since the Spearman and Kendall correlation results as shown in Table 21 are very similar, the discussion of the results will utilize only one of the tests, the Spearman correlation results. The results are discussed for each risk factor as follows:

Durability Risk

The correlation analysis results for durability risk shows that when the "composite" risk measure (PRDURAB) and the "importance" measure (IMDURAB) are used as the definition of risk, there is a significant negative relationship, as hypothesized, between durability risk perceived (PRDURAB) or (IMDURAB) and acceptability of durability risk (ADURAB). The Spearman correlation coefficients are -0.2631 and -0.3723 respectively, with both significant at the .001 level.

Safety Risk

When safety risk is defined in terms of the importance of the risk factor to the individual (IMSAFE), there is a significant negative correlation between perceived safety risk and the acceptability of safety risk (ASAFE). On the

TABLE 21

RANK-ORDER CORRELATION ANALYSIS

	RISK MEASURE	ACCEPTABILITY OF RISK	KENDALL CORR COEFF.	SIGNIF. OF	SPEARMAN CORR COEFF.	SIGNIF. OF
1.	DURABILITY RISK	--	--	--	--	--
	- PRDURAB	ADURAB	-0.1976	.001	-0.2631	.001
	- IMDURAB	ADURAB	-0.3133	.001	-0.3723	.001
	- LDURAB	ADURAB	0.0403	.186	0.0514	.190
2.	SAFETY RISK	--	--	--	--	--
	- PRSAFE	ASAFE	0.0431	.176	0.0541	.178
	- IMSAFE	ASAFE	-0.3742	.001	-0.4055	.001
	- LSAFE	ASAFE	0.1147	.008	0.1388	.009
3.	COMFORT RISK	--	--	--	--	--
	- PRCOMF	ACOMF	0.1599	.001	0.2207	.001
	- IMCOMF	ACOMF	-0.3290	.001	-0.3914	.001
	- LCOMF	ACOMF	0.2316	.001	0.2960	.001
4.	GAS MILEAGE RISK	--	--	--	--	--
	- PRMILE	AMILE	.0001	.500	-0.0016	.489
	- IMMILE	AMILE	-0.3231	.001	-0.4051	.001
	- LMILE	AMILE"	0.1374	.001	0.1737	.001
5.	PRICE RISK	--	--	--	--	--
	- PRPRICE	APRICE	0.0377	.192	0.0491	.201
	- IMPRICE	APRICE	-0.3190	.001	-0.3828	.001
	- LPRICE	APRICE	0.1297	.002	0.1658	.002
6.	SOCIAL RISK	--	--	--	--	--
	- PRSOCIAL	ASOCIAL	-0.2435	.001	-0.3086	.001
	- IMSOCIAL	ASOCIAL	-0.2979	.001	-0.3524	.001
	- LSOCIAL	ASOCIAL	-0.1277	.003	-0.1538	.004
7.	RESALE VALUE RISK	--	--	--	--	--
	- PRRESALE	ARESALE	-0.0288	.248	-0.0389	.253
	- IMRESALE	ARESALE	-0.3674	.001	-0.4550	.001
	- LRESALE	ARESALE	0.1194	.003	0.1528	.004

other hand, when safety risk is defined in terms of the likelihood of the risk occurring, the relationship between risk perception (LSAFE) and risk acceptability (ASAFE) is positive and significant at .009 level.

Comfort Risk

All three measures of risk, the "composite" (PRCOMF), the "importance" (IMCOMF) and likelihood (LCOMF) measures show significant correlations with comfort risk acceptability (ACOMF) ($p < .001$). However, only the importance measure (IMCOMF) confirms the hypothesis of a negative relationship between perceived comfort risk and the acceptability of comfort risk.

Gas Mileage Risk

The "importance" (IMMILE) and "likelihood" LMILE) measures of risk show significant correlation ($p < .001$) between mileage risk perceived and acceptability of mileage risk (AMILE). However, only the IMMILE correlation with AMILE (-0.4051) supports the hypothesis of an inverse relationship.

Price Risk

Similar to the gas mileage risk results, both the "important" (IMPRICE) and "likelihood" (LPRICE) measures have significant correlations with the acceptability of price risk (APRICE). Again, however, only IMPRICE shows a correlation in the hypothesized direction, that is -0.3828 with $p < .001$. The correlation between LPRICE and APRICE is positive (.1658) and significant at the .002 level.

Social Risk

For social risk, all three measures of risk (PRSOCIAL, IMSOCIAL and LSOCIAL) have significant inverse relationships with the acceptability of social risk (ASOCIAL), with correlation of -0.3086 ($p < .001$), -0.3524 ($p < .001$) and -0.1538 ($p < .004$) respectively. These results support the hypothesis of negative correlation between social risk perceived and the acceptability of social risk.

Resale Value Risk

The "importance" (IMRESALE) and "likelihood" (LRESALE) measures of resale value risk have significant correlation with the acceptability of resale value risk (ARESALE). However, only IMRESALE has a negative correlation with ARESALE (-0.4550 with $p < .001$) as hypothesized. LRESALE on

the other hand, has a significant positive relationship with ARESALE (0.1528 with $p < .004$).

Overall, the "importance" measure of risk shows a significantly negative correlation with the acceptability of risk for each of the risk factors, lending support to the hypothesis that the higher the perception of a risk factor, the less acceptable is that risk. However, the other two measures of risk, that is, the "composite" and "likelihood" meaures do not always support the hypothesis since there are instances of positive rather than negative correlation.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter presents a summary of the objectives of the study, and the design and methodology used. It also discusses the conclusions arrived at based on the study results. Finally, some recommendations are made relating to marketing implications of the findings, and areas for further research are suggested.

Summary

This section deals with a summary of the research objectives, the scope of the study, relevant literature and previous studies in the area, and the research design and methodology employed.

Objectives of the Study

The primary objective of this study was to determine the impact of product holding time on consumers' risk perception and risk acceptance. That is, first, to determine if consumers' intention to hold onto a product for a long time influences their perception of risk in the product. Secondly, to determine if consumers' product holding time

impacts their tolerance of risks perceived in the products. A third objective was to determine if perception of a high risk by consumers invariably means that those risks are also intolerable to the consumers.

As pointed out by several authors and researchers, there appears to be a considerable vacuum in the marketing literature regarding the time dimension of consumer decision-making (Schary, 1971; Jacoby, Szybillo and Berning, 1976). As Jacoby, Szybillo and Berning (1976) noted, consumption has historically been treated as an instanteneous act without time implications or consequences. It is necessary, therefore, that current research address the question of time as it relates to consumption decisions.

Consumer risk perception in products is a theme which has been very prominent in the consumer behavior research over the past two decades. Conspicuously missing from most of the published literature in the area is the time dimension or implication, if any, of consumer risk perception. The objective of the present research was to provide some insight into this time dimension, and hopefully to trigger further arguments and research in this area.

Scope of the Study

The study focused on the impact of product holding time on risk perception and acceptance of the perceived risks in

a product. Since there is a considerable research evidence to suggest that perceived risk is an important factor in consumers' purchase decisions (see, for example, Ross' review of the literature, 1975), the current study was not designed to examine the risk versus choice relationship again. Instead, the focus was on a factor (i.e. the product holding time) that might impact the risk perception which subsequently affects the product choice decision.

Relevant Studies

There is a substantial body of literature on perceived risk and its implications on consumer behavior. In relation to the current study, the most pertinent literature involve studies dealing with risk measurement methodologies (Cunningham, 1967; Jacoby and Kaplan, 1972; Kaplan, Szybillo and Jacoby, 1974; Johnston and Choffray, 1979); types of risk perceived by consumers (Schiffman, 1972; Jacoby and Kaplan, 1972; Zikmund and Scott, 1973); risk acceptability and measurement methodology (Rethans and Albaum, 1980; Slovic, Fischhoff and Lichtenstein, 1980; Jacoby, 1980). Studies such as those referenced above provided significant information in terms of both design and measurement of the perceived risk and risk acceptability constructs.

Research Design and Methodology

The test instrument was a self-administered questionnaire which was developed subsequent to the completion and analysis of a pilot study. The pilot study conducted involved 104 respondents. The objective of the pilot study was to determine the perceived useful life of an automobile, the product category used to test the various hypotheses formulated. Based on the pilot study results, a questionnaire was developed with product holding time (PPHT) manipulated such that for each respondent, the PPHT was either greater than, equal to or less than the average perceived useful life (10 years) as determined from the pilot study. The questionnaire was designed to measure respondents' level of risk perception and ranking, as well as the acceptability of various risk factors in an automobile. The risk factors measured include durability, safety, social/prestige, gas mileage, comfort, price and resale value.

The test sample comprised of 293 respondents, each of whom was randomly assigned to one of five groups representing the five product holding times (PPHT) classifications. Each respondent's risk perception and risk acceptance was evaluated within only one product holding time assumption. No respondent was aware of the existence of the other four PPHT assumptions.

The hypotheses developed were based primarily on the proposition that a respondent's level of risk perception will vary directly with the length of planned holding time of a product. In addition, it was hypothesized that a respondent's risk tolerance (or acceptance) will be lower as product holding time (PPHT) increases.

The statistical techniques used inlcuded a parametric analysis of variance (ANOVA) as well as a non-parametric one way analysis of variance (Kruskal-Wallis ANOVA). The results of the statistical analyses showed that there were no major differences in the two test procedures; hence, both methods seemed equally appropriate for analyzing the data. Additional analysis included "a posteriori" comparison of group means where significant differences were observed based on the ANOVA and the K-W tests. Analysis of covariance (ANCOVA) was also used to control for certain "possibly disturbing" variables. Finally, Multiple Classification Analysis (MCA) tables were used to facilitate examination of the "pattern" of results.

Conclusions

This section presents some conclusions drawn from the results of the study. The conclusions are divided into two broad categories: 1) those relating to overall descriptive sample statistics results, i.e. those which are not based

on specific hypotheses, and 2) those relating to hypothesized relationships.

Conclusions from Descriptive Sample Statistics

The overall sample statistics suggest that automobile buyers consider a car's safety on the road as the most important of all the seven risk factors measured. This finding holds true regardless of how long consumers might want to use the car. The results, furthermore, indicate that safety is the most unacceptable risk factor. The above strongly suggests that consumers may not be willing to compromise on safety.

The data also shows that the prestige element or social risk related to car ownership is the least important of the risk factors, according to the ranking by the respondents. In terms of tolerance, the respondents consider the prestige element as the most tolerable of the risk factors. This suggests that the prestige associated with car ownership may not be as strong as generally believed (see McCrohan, 1978), compared to the other factors examined in this study.

It may also be concluded from the results that resale value and price are not major considerations and that poor resale value and high prices are relatively tolerable. On the other hand, durability and good gas mileage are very important considerations respectively, after safety risk.

The preceding results seem to be consistent with the fact that consumers are holding onto their cars longer (the average car on the road in 1984 was estimated to be about seven years old); this would imply that the initial price and the resale value are not as important as the durability and good gas mileage, both of which impact the ongoing running costs which are important over the long term.

Conclusions Based on Hypothesized Relationships

This section presents some conclusions drawn from the hypotheses tested. Three categories of hypotheses were tested: 1) those relating perceived risk to product holding time, 2) hypotheses regarding relationship between risk acceptance (or tolerance) and product holding time, and 3) those hypotheses relating perceived risk and risk acceptance.

As explained in chapter IV perceived risk was defined in three ways. The first approach defined risk multiplicatively as a product of the importance attached to a risk factor and the likelihood of the risk occurring. The second and third approaches defined risk respectively in terms of the importance of the risk factor only or the likelihood of the risk factor.

The first category of hypotheses were designed to measure the level of risk perception relative to product

holding time. The results indicate that only durability risk has a significant difference in risk perception at the .05 level or better for all the three definitions of risk. That is, regardless of which of the above three measures is used to define risk, durability risk shows a statistically significant difference in the groups' level of risk perception. A Tukey test performed to determine which groups are different shows that Group I is the one group which is consistently different from the other groups with respect to perceived durability risk. The "importance" definition results show that Group 1 is different from all the other four groups; the "composite" and "likelihood" definition results, however, show that Group I is different from Group II only.

Other risk factors which exhibit statistically significant differences among groups include social risk, mileage risk, resale value and comfort risk. However, the pattern of results do not always show an increasing level of risk perception as product holding time increases. Generally, however, the results indicate that for those significantly different results, Group I, which has the lowest product holding time of 1 year, is the group which is different from other groups and perceives less risk than the other groups, except in the case of resale value. For resale value the results from the "importance" definition show that as

product holding time increases, the importance attached to resale value decreases.

Overall, while there is some evidence from the study to suggest that there are differences in risk perception relative to product holding time, the evidence is not strong enough to conclude that there is a positive relationship. It is perhaps, more appropriate to conclude that different risk factors might be perceived differently relative to product holding time. For example, resale value risk is found to be most important to those who intend to dispose of the product early; on the other hand, safety risk which is rated as the most important risk element is probably so important that no matter how one measures safety risk, there is no difference in perceived safety risk whether the consumer intends to hold onto the product for a short time or for a long time.

The Strategic implications of the above results are that marketers need to identify and examine the specific types of risk which are relevant to a product and then determine if product holding time has any impact on the risks identified. This type of analysis is important since it is risky to assume that product holding time and risk perception are either positively or negatively related. As demonstrated in this research, different results may be obtained for specific types of risk. For example, as may

probably be expected, durability risk is significantly lower for consumers who intend to use their cars for a very short time (1 year) compared to those who intend to use it for 5 years or more. However, there is no holding time impact of the most important risk element (i.e. safety risk) in a car, while a negative relationship is obtained for resale value risk. The negative relationship results of the resale value risk are not necessarily obvious since one could have assumed that generally consumers who keep their cars for a long time might be more concerned about a good resale price than those who keep their cars for a short time.

The second category of hypotheses dealt with the relationship between risk tolerance (or acceptability) and product holding time. It was hypothesized that the unacceptability of a risk factor would increase as product holding time increases.

The hypotheses tests showed that three of the risk factors had significant differences between groups using the ANOVA as well as the K-W test procedures. These risk factors are durability, social and resale value risks. Group I is again shown to be the group which is different from the other groups, both for durability and resale value. For social risk, the results indicate that Group II and Group III are the ones which are different.

While resale value shows a significant difference as mentioned above the pattern of results for this risk factor again demonstrates a reverse relationship. That is, the shorter the product holding time, the less acceptable the resale value risk. It may be recalled that a similar result was obtained for risk perception, where resale value was significantly more important to the shorter product holding time respondents.

Safety risk, which is the most important risk element, and also the least acceptable over the total sample, again shows no significant difference among the groups. It may, therefore, be concluded from the above that the effect of product holding time on risk acceptability seems to vary with the nature of the specific risk.

The third category of hypotheses examined net risk relative to product holding time. Net risk was defined as risk perceived less the amount of that risk which is acceptable to the respondent. It was hypothesized that net risk would increase directly with product holding time. The results showed that there were significant differences between groups for net durability, social and gas mileage risks. However, the pattern of results does not indicate a higher net risk for respondents with longer product holding time. The conclusion may be made that while the study shows, (as explained in the next paragraph) that high risk

perceived is also highly unacceptable, this phenomenon is not necessarily dependent on how long a consumer intends to use the product under consideration.

The last set of hypotheses dealt with the relationship between the level of risk perceived and the amount of the risk which is acceptable to the consumer. It was hypothesized that the amount of risk perceived by a consumer is inversely related to the amount of the risk which the consumer is willing to accept. For these hypotheses, a rank-order correlation analysis was performed. Overall, the results confirmed the hypothesized relationships with significant negative correlations obtained for all the risk factors, particularly when a risk factor is defined in terms of its "importance" to the consumer. It is, therefore, concluded that risks that are generally perceived to be high would tend to be less acceptable than risks that are considered low.

The implications of the above results relate to marketers' interpretations of the impact of consumers' risk perception on their product decisions. Since the findings suggest that consumers are highly intolerant of risks that they perceive to be high, it implies that consumers may not want to compromise on such risks. Therefore, a marketer could not assume that consumers may disregard or discount high risks in their products and decide to buy them if a

reasonable alternative with lower risk exists, especially where the risk factor involved is considered very important by the consumer.

Recommendations and Future Research

In the process of preparing this manuscript, the researcher had the opportunity of discussing the experiences of one recent new car buyer. The prospective car buyer had visited a dealership and in their discussions the salesman wanted to know how long the prospective buyer intended to keep the car she was considering. The buyer indicated that she intended to use the car "forever." The prospective buyer was not pleased with the discussions which followed next, since the salesman went on to preach to her that the car she was considering had an "excellent resale value."

The preceding episode probably underscores the essence of the current study. The salesman apparently posed the right questions, including a desire to know how long the prospective car buyer intended to hold onto the car. On the other hand, he seemed to have only one set of suggestions or advice, irrespective of the responses from the customer. No wonder the customer was displeased with the "good news" about the resale value.

Based on the conclusions drawn from the current research, certain recommendations are in order. First, it is

recommended that despite the lack of a strong positive relationship between perceived risk and planned product holding time, there is a need to incorporate the holding time concept in marketing strategy decisions. This is necessary because the results of the research indicate that a relationship may exist between some specific risk types and holding time, even if it is a negative relationship, as was the case with resale value. Such relationships need to be identified and dealt with rather than ignored. This will hopefully eliminate such mistakes as made by the salesman referred to above. As shown in this study, the importance of resale value of a car diminishes with planned holding time of the car, contrary to what was hypothesized in this study and probably misunderstood by our salesman.

Second, it is recommended that in marketing strategy decisions consideration should be given to risk factors which are specific and also relevant to the products under consideration. Certain risk factors may be more important in relation to some products than to others. For example, resale value may be important in relation to cars and probably real estate and may not be so important in many household durables. It may not also be assumed that the importance of a risk factor necessarily means that it might be more important in relation to product holding time. For example, it was clearly shown that while safety in a car is

extremely important to consumers, its importance is not different whether the consumer intends to use the car for a long time or a short time.

Third, the results of the study indicate that high risks perceived also tend to be highly unacceptable to the consumer. Therefore, marketers should not downplay perception of risk and hope that consumers would ignore risks perceived in the products offered and decide to buy them anyway.

Fourth, with specific reference to automobiles, it is recommended that auto-makers direct sufficient energies to improving and selling "safety" in automobiles. This recommendation is based on the strong evidence in the study regarding the importance of auto safety to consumers. On the other hand, the evidence suggests that there should not be as much emphasis on promotional strategies directed at prestige elements in automobile ownership.

Fifth, it appears automobile marketers' initial price considerations should not outweigh gas mileage and durability factors, since consumers are not as concerned with price as they are with gas mileage and durability. The latter two factors highly impact overall ongoing costs which could be significantly greater than an initial price differential.

There are areas related to this research which need further research. One of these involves the issue of consumer risk perception and acceptance relating to instances where there is choice versus no choice in product holding time. It was suggested in the introductory chapter of this study that consumers may sometimes be "stuck" with a product over its useful life for reasons such as a non-existent resale market. Risk perception and acceptability relative to holding time in circumstances such as above is worth investigating.

Other possible future research might focus on non-durable consumer products as well as other durables. While the current research focused on a major consumer durable, it might be necessary to test the applicability and effect of the product holding time concept on non-durable and other durable products.

APPENDIX I

PILOT STUDY QUESTIONNAIRE

1. Do you own an automobile? Yes _____ No _____
2. If Yes, specify the (a) Make _____
   (b) Model _____
   (c) Year _____

3. If No, what type of car would you like to own?
   (a) Make _____
   (b) Model _____
4. How important are the following features in the car of your choice? Indicate your response by circling the number on the scale provided.

	Extremely Important					Extremely Unimportant
Safety	1	2	3	4	5	6
Mileage (Economy)	1	2	3	4	5	6
Comfort	1	2	3	4	5	6
Durability	1	2	3	4	5	6
Resale Value	1	2	3	4	5	6
Prestige	1	2	3	4	5	6
Price	1	2	3	4	5	6

5. Rank the following features of a car in their order of importance to you in the ownership of a car: (1 = Most Important thru 7 = Least Important)

	Rank		Rank
Safety	____	Durability	____
Mileage (Economy)	____	Resale Value	____
Comfort	____	Prestige	____
		Price	____

6. What do you percieve as the total life span of the car of your choice (irrespective of whether you might dispose of it earlier or not) (Years).

APPENDIX II

AUTOMOBILE OPINION QUESTIONNAIRE

For Office use only

This questionnaire deals with your attitudes and opinions about a car. Please follow the instructions provided and answer ALL questions. Thank you for your cooperation. 1-4 __

Think about a car that you would like to buy. If you already own a car, think about one that you'd like to buy next. Assume you are in a position to buy that car now and intend to use it continuously for 1 year before replacing it. We know you could keep this car longer or shorter, but for the purposes of this study, please assume you intend to use it for 1 year and answer the following questions related to the purchase of the car. (Circle your answer). 6-7 __ APHT

Q. 1 a) How important is it for you that the car last a long time?

1	2	3	4	5	6	7	8	9
Extremely Unimportant								Extremely Important

9 __ IMDUCAB

b) How likely is it that the car will not last as long as you intended it to?

1	2	3	4	5	6	7	8	9
Extremely Unlikely								Extremely Likely

11 __ LDUCAB

Q. 2 a) How important is it for you that the car be safe on the road?

1	2	3	4	5	6	7	8	9
Extremely Unimportant								Extremely Important

13 __ IMSAFE

b) How likely is it that the car would not be safe on the road?

1	2	3	4	5	6	7	8	9
Extremely Unlikely								Extremely Likely

15 __ LSAFE

Q. 3 a) How important is it for you that the car be comfortable?

1	2	3	4	5	6	7	8	9
Extremely Unimportant								Extremely Important

17 __ IMCONF

b) How likely is it that the car will not be comfortable?

1	2	3	4	5	6	7	8	9
Extremely Unlikely								Extremely Likely

19 __ LCONF

Q. 4 a) How important is it for you that the car gets good gas mileage?

1	2	3	4	5	6	7	8	9	
Extremely Unimportant								Extremely Important	21 __ IMMILE

b) How likely is it that the car will not get good gas mileage?

1	2	3	4	5	6	7	8	9	
Extremely Unlikely								Extremely Likely	23 __ LMILE

Q. 5 a) How important is it for you that the car be worth what you pay for it?

1	2	3	4	5	6	7	8	9	
Extremely Unimportant								Extremely Important	25 __ IMPRICE

b) How likely is it that the car will not be worth what you pay for it?

1	2	3	4	5	6	7	8	9	
Extremely Unlikely								Extremely Likely	27 __ LPRICE

Q. 6 a) How important would it be to you if others thought less of you because you bought this car?

1	2	3	4	5	6	7	8	9	
Extremely Unimportant								Extremely Important	29 __ IMSOCIAL

b) How likely is it that others will think less of you if you were to buy this car?

1	2	3	4	5	6	7	8	9	
Extremely Unlikely								Extremely Likely	31 __ LSOCIAL

Q. 7 a) How important is it for you that the car has good resale value?

1	2	3	4	5	6	7	8	9	
Extremely Unimportant								Extremely Important	33 __ IMRESALE

b) How likely is it that the car will not have a good resale value?

1	2	3	4	5	6	7	8	9	
Extremely Unlikely								Extremely Likely	35 __ LRESALE

(PLEASE TURN TO NEXT PAGE)

Q. 8 a) How important is it for you that overall, the car should meet your expectations?

1	2	3	4	5	6	7	8	9	37 __
Extremely Unimportant								Extremely Important	IMRISK

b) How likely is it that overall, the car will not meet your expectations?

1	2	3	4	5	6	7	8	9	39 __
Extremely Unlikely								Extremely Likely	LRISK

Q. 9 Please rank the following seven features of a car in the order of their importance to you. Keep in mind you intend to use your car for 1 year. (Remember that the most important feature to you should be "1" in your ranking and the least important feature should be ranked number "7").

Feature	Rank	41-53
Safety	_____	
Mileage/Economy	_____	
Comfort	_____	
Durability	_____	
Prestige	_____	
Price	_____	
Resale Value	_____	

(PLEASE TURN TO NEXT PAGE)

Part II

Since the world is not perfect, there is a likelihood that the car will not fully meet your expectations in terms of durability, safety, comfort, gas mileage, value for the price, social approval or prestige and resale value. Therefore, **you may have to accept a certain amount of dissatisfaction or deficiency in the above features before you decide to buy the car.**

Below, please indicate how much dissatisfaction or deficiency in the features you are willing to accept. If you indicate, for example, "extremely unacceptable" for a feature, it means the likelihood that this feature may not measure up to your expectation will make you decide outright not to buy the car. Remember, you intend to use the car for 1 year. (Circle your answer)

Q. 1 **The likelihood that the car will not last long**

1	2	3	4	5	6	7	8	9	
Extremely Unacceptable								Extremely Acceptable	55 ADURAB

Q. 2 **The likelihood that the car will not be safe**

1	2	3	4	5	6	7	8	9	
Extremely Unacceptable								Extremely Acceptable	57 ASAFE

Q. 3 **The likelihood that the car will not get good gas mileage**

1	2	3	4	5	6	7	8	9	
Extremely Unacceptable								Extremely Acceptable	59 AMILE

Q. 4 **The likelihood that friends and relatives will will not approve of the car**

1	2	3	4	5	6	7	8	9	
Extremely Unacceptable								Extremely Acceptable	61 ASOCIAL

Q. 5

The likelihood that the car will not be comfortable

1	2	3	4	5	6	7	8	9	
Extremely Unacceptable								Extremely Acceptable	63 ACOMF

(PLEASE TURN TO NEXT PAGE)

Q. 6 The likelihood that the car will not be worth what you paid for it

1	2	3	4	5	6	7	8	9
Extremely Unacceptable								Extremely Acceptable

65 __
APLICE

Q. 7 The likelihood that the car will not have good resale value

1	2	3	4	5	6	7	8	9
Extremely Unacceptable								Extremely Acceptable

67 __
ARESALE

Q. 8 You may be more tolerant of a "dissatisfaction" with some of the above features than others. Below, please rank the features in order of how tolerant you might be if you are dissatisfied with them. The one whose dissatisfaction you are least likely to tolerate should be ranked "7", etc down to "1" for the one you are most likely to tolerate.

#2
ID=1-4

Feature	Rank
Durability	_____
Safety	_____
Comfort	_____
Economy/Mileage	_____
Prestige	_____
Price	_____
Resale Value	_____

6-18 _

(PLEASE TURN TO THE NEXT PAGE)

Part III

Q. 1 Please write the name and model of the car you had in mind when answering the above questions.

Make _____
Model _____

19 __
22 __
CARTYP

Q. 2 What do you think is the total life span of the car you had in mind (irrespective of whether you intend to use it for a shorter period or not)

_____ years.

25 __
PPUL

Q. 3 Given your present circumstances, how long would you keep that car if you had it?

Less than 1 year _____
1 - 3 years _____
4 - 5 years _____
6 - 10 years _____
11 - 12 years _____
More than 12 years _____

27 __
EHT

Q. 4 Do you own at least one car right now? Yes _____ No _____
If "yes" write the name and model of the car. (If you own more than one write the name and model of the one you like best)

Make _____
Model _____
Model year _____

31-39_

Q. 5 How long have you owned the above car?

Less than 1 year _____
1 - 3 years _____
4 - 5 years _____
6 - 10 Years _____
11 - 12 years _____
More than 12 years _____

41 __

Q. 6 Given your present circumstances, how much longer are you likely to keep this car?

Less than 1 year _____
1 - 3 years _____
4 - 5 years _____
6 - 10 years _____
11 - 12 years _____
More than 12 years _____

43 __

Q. 7 How many cars have you owned in your lifetime?

None _____
One car _____
2 - 3 cars _____
4 - 5 cars _____
More than 5 years _____

45 __

Q. 8 Please provide the following additional information.

a. Your age:

Under 25 _____
25 - 34 _____
35 - 44 _____
44 - 54 _____
55 and over _____

47 __

b. Your marital status

Married _____
Single _____
Widowed _____
Divorced _____
Separated _____

49 __

c. The size of your household

One member _____
Two members _____
Three members _____
Four members or more _____

51 __

d. Your sex

Male _____
Female _____

53 __

e. Your occupation _____
(Not company, type of work you do)

55 __

f. Total Annual Income of your Household

Under $10,000 _____
$10,000 - 14,999 _____
$15,000 - 19,999 _____
$20,000 - 24,999 _____
$25,000 - 34,999 _____
$35,000 - 44,999 _____
$45,000 - 54,999 _____
$55,000 and over _____

57 __

THANK YOU FOR YOUR COOPERATION

APPENDIX IIIA

COVARIATE BY FACTOR INTERACTION TEST

SPSS Regression program was used to test for covariate by factor interaction. This method involves creating dummy variables for the factor (PPHT). Two separate interaction tests were performed, one for each covariate, namely EHT and PPUL.

The hypothesis was:

H_0: B_3 (interaction term) = 0
H_A: $B_3 \neq 0$

$$F = \frac{SSR(b_1, b_2, b_3) - SSR(b_1, b_2)/M}{(SSE(b_1, b_2, b_3)/(n-p-1)} \qquad F_{(1,\ n-p-1)}$$

Where, SSR = Regression sum of squares
SSE = Error sum of squares
n = # of observations in sample
p = # of independent variables (including dummy variables)
m = # of independent variables in subset

$$F(\text{critical}) = F_{(0.95)\ m,\ n-p-1} = F_{(0.95)\ 4;\ 283} = 2.37$$

(1) EHT by PPHT Interaction Test Using Sample Data from Computer Output:

$$F = \frac{(9328.86 - 8186.57)/M=4}{122592.94/n-p-1 = 283}$$

$$F = \frac{1142.29/4}{443.79}$$

$$F = 0.64 < F_{0.95(4;283)} = 2.37$$

Conclusion = No significant covariate (EHT) by Factor (PPHT) interaction exists

(2) PPUL by PPHT Interaction Test Using Sample Data from Computer Output:

$$F = \frac{(17,525.26 - 12,622.99/M=4}{117,396.54/n-p-1 = 283}$$

$$F = \frac{4,902.27/4}{414.83}$$

$$F = 2.95 > F_{0.95(4;283)} = 2.37$$

Conclusion = There is a significant interaction effect between covariate PPUL and Factor PPHT

APPENDIX IIIB

SIGNIFICANCE TEST OF THE COEFFICIENT OF COVARIATE "EHT"

DEPENDENT VARIABLE(y) (RISK MEASUREMENT)	COVARIATE B	STD. ERROR	T-VALUE	SIGNIF. OF T.	95% CONF. INTERVAL ESTIMATE OF B	
					LOWER	UPPER
PRDURAB	1.70	1.00	1.69	.092	-0.28	3.68
PRSAFE	-1.63	1.07	-1.53	.127	-3.73	0.47
PRMILE	0.84	0.79	1.06	.291	-0.72	2.40
PRPRICE	-1.23	1.07	-1.15	.251	-3.33	0.87
PRCOMF	-0.75	0.86	-0.87	.383	-2.44	0.94
PRSOCIAL	-1.34	0.53	-2.50	.013	-2.39	-0.29*
PRRESALE	-0.78	0.86	-0.90	.368	-2.48	0.92
PRRISK	-0.88	0.94	-0.94	.350	-2.73	0.97
NDURAB	1.90	1.03	1.84	.067	-0.14	3.94
NSAFE	-1.46	1.07	-1.37	.173	-3.56	0.64
NCOMF	-0.73	0.85	-0.85	.394	-2.40	0.95
NMILE	1.04	8.80	1.30	.196	-0.54	2.16
NPRICE	-1.12	1.07	-1.04	.297	-3.22	0.99
NSOC	-1.70	0.57	-2.96	.003	-2.83	-0.57*
NRESALE	-0.93	0.88	-1.06	.289	-2.66	0.79
NRISK	-0.85	0.94	-0.91	.365	-2.71	1.00

* Covariate Coefficient Significant at .05 level

APPENDIX IIIB (Cont'd.)

SIGNIFICANCE TEST OF THE COEFFICIENT OF COVARIATE "EHT"

DEPENDENT VARIABLE(y) (RISK MEASUREMENT)	COVARIATE B	STD. ERROR	T-VALUE	SIGNIF. OF T.	95% CONF. INTERVAL ESTIMATE OF B	
					LOWER	UPPER
IMDURAB	.35	.09	3.70	.000	.17	.54*
IMSAFE	.19	.07	2.85	.005	.06	.32*
IMMILE	.30	.09	3.53	.000	.13	.47*
IMSOCIAL	-.36	.10	-3.52	.001	-.56	-.16*
IMCOMF	.03	.07	0.43	.668	-.11	.18
IMPRICE	.18	.08	2.17	.031	.02	.34*
IMPRESALE	-.13	.09	-1.34	.182	-.33	.06
IMPORT	.57	.31	1.81	.071	-.05	1.18
LDURAB	.05	.10	0.44	.662	-.16	.25
LSAFE	-.26	.12	-2.15	.033	-.49	-.02*
LMILE	-.06	.09	-0.58	.560	-.25	.14
LSOCIAL	-.11	.10	-1.01	.313	-.31	.10
LCOMF	-.09	.10	-0.93	.355	-.30	.11
LPRICE	-.25	.12	1.99	.047	-.49	-.01*
LRESALE	-.04	.11	-0.30	.762	-.26	.19
ADURAB	-.20	.10	-1.97	.050	-.40	-.01*
ASAFE	-.17	.08	-2.14	.033	-.33	-.02*
AMILE	-.20	.08	-2.38	.018	-.36	-.03*
ASOCIAL	.37	.12	3.12	.002	.14	.60*
ACOMF	-.02	.08	-0.29	.773	-.18	.14
APRICE	-.11	.10	-1.09	.277	-.31	.09
ARESALE	.16	.09	1.61	.108	-.03	.35

* Covariate Coefficient Significant at .05 level

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