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DISSERTATION

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
School of The Ohio State University

By
Bruce R. Siecker, B.S., M.S.

The Ohio State University
1974

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# TABLE OF CONTENTS

VITA ....................................................... ii  
LIST OF TABLES ........................................... v  
LIST OF FIGURES. ........................................... vii  

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Description of the Study</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Objectives</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Limitations of the Study</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Overview</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>EVOLUTION OF THE PERCEIVED RISK CONCEPT.</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Origin</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Subsequent Efforts</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Illustrative Research</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Drug-Physician Studies</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>CONCEPTS AND RELATIONSHIPS</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>Conceptualization of Risk</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dimensions of Drug Decision-Making</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Utility of Research</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hypotheses</td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>STUDY METHODS AND DESIGN</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>Method-Design Overview</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Developmental Testing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Scaling Methods</td>
<td></td>
</tr>
<tr>
<td></td>
<td>General Information Questionnaire</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Selected Products for Testing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Preference-Experience Questionnaire</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Choice Dilemmas Questionnaire</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Antibiotic Preference</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Study Design</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sampling Frame</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Procedures and Treatments</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Considerations for Analysis</td>
<td></td>
</tr>
</tbody>
</table>
# Chapter V  STUDY FINDINGS

- General Results
- Analytic Findings
- Summary of Findings

# VI  DISCUSSION AND CONCLUSIONS

## APPENDIX

| A | Consent Form .......................... 175 |
| B | General Information Questionnaire .... 177 |
| C | Preference-Experience Questionnaire .. 180 |
| D | Choice Dilemmas Questionnaire ......... 187 |
| E | Antibiotic Preference for Sub-Sample C₁ .................................. 191 |
| F | Antibiotic Preference for Sub-Sample E₁ .................................. 194 |
| G | Antibiotic Preference for Sub-Sample C₂ .................................. 197 |
| H | Antibiotic Preference for Sub-Sample E₂ .................................. 199 |
| I | Spearman Rank Order Correlations of Interdrug Preference for Sub-Sample C₁ .................................. 202 |

## BIBLIOGRAPHY ................................. 204
<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Summary Statistics of General Respondent Characteristics by Type of Sub-Sample</td>
<td>142</td>
</tr>
<tr>
<td>2</td>
<td>Relative Interest in Five Products by Type of Sub-Sample</td>
<td>143</td>
</tr>
<tr>
<td>3</td>
<td>Median Importance of Purchase Decision for Five Products by Type of Sub-Sample</td>
<td>144</td>
</tr>
<tr>
<td>4</td>
<td>Summary Frequencies of Purchase Cycle of Five Products by Type of Sub-Sample</td>
<td>145</td>
</tr>
<tr>
<td>5</td>
<td>Summary Frequencies of Sub-Sample Prescription Consumption Experience</td>
<td>147</td>
</tr>
<tr>
<td>6</td>
<td>Summary Frequencies of Sub-Sample Side Effect Experience</td>
<td>149</td>
</tr>
<tr>
<td>7</td>
<td>Median Preference Scores for Twelve Antibiotics by Type of Sub-Sample</td>
<td>150</td>
</tr>
<tr>
<td>8</td>
<td>Results of Mann-Whitney U Analysis for $H_1$ for Antibiotic Preference</td>
<td>152</td>
</tr>
<tr>
<td>9</td>
<td>Results of Mann-Whitney U Analysis for $H_2$ for Antibiotic Preference</td>
<td>153</td>
</tr>
<tr>
<td>10</td>
<td>Relative Preference for Twelve Antibiotics Within the $C_1$ Sub-Sample</td>
<td>155</td>
</tr>
<tr>
<td>11</td>
<td>Coleman Multivariate Analysis of the Effect of Antibiotic Attribute on Antibiotic Preference for Sample $C_1$</td>
<td>156</td>
</tr>
<tr>
<td>12</td>
<td>Spearman Rank Order Correlations of Antibiotic Preference and Selected Control Variables for Sample $C_1$</td>
<td>159</td>
</tr>
<tr>
<td>Table</td>
<td>Spearman Rank Order Correlations of Antibiotic Preference and Selected Control Variables for Sample $E_1$</td>
<td>Page</td>
</tr>
<tr>
<td>-------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>13</td>
<td>$E_1$</td>
<td>160</td>
</tr>
<tr>
<td>14</td>
<td>$C_2$</td>
<td>161</td>
</tr>
<tr>
<td>15</td>
<td>$E_2$</td>
<td>162</td>
</tr>
<tr>
<td>Figure</td>
<td>Description</td>
<td>Page</td>
</tr>
<tr>
<td>--------</td>
<td>--------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>1</td>
<td>Consumer Decision-Process Model</td>
<td>63</td>
</tr>
<tr>
<td>2</td>
<td>Eight Polar Experience Conditions</td>
<td>104</td>
</tr>
<tr>
<td>3</td>
<td>Summary of Antibiotics</td>
<td>120</td>
</tr>
<tr>
<td>4</td>
<td>Experimental Format</td>
<td>134</td>
</tr>
<tr>
<td>5</td>
<td>Preference Effect Model</td>
<td>154</td>
</tr>
<tr>
<td>6</td>
<td>Summary of Primary Study Conclusions</td>
<td>167</td>
</tr>
</tbody>
</table>
CHAPTER I

INTRODUCTION

This chapter outlines an empirical study which was concerned with consumer risk perception. It describes the scope of the project, specifies the research objectives, and summarizes the focus of succeeding chapters.

DESCRIPTION OF THE STUDY

The concept of risk, per se, is not new. The notion that risk might conceivably serve as an adjunct to understanding the complexities of consumer behavior, however, was formally introduced only in 1960.¹ Since that time, Bauer's original challenge to seek understanding of the consumer through risk measurement has been answered by a myriad of researchers in the social sciences. Not all efforts have borne fruit, but, as a result of numerous investigations,² risk perception has emerged as a major thrust of consumer behavior research. Indeed, it is possible to conclude that


Bauer's original thinking still remains largely unexplored, and thus awaits the attention of creative researchers to tap its broader dimensions.

Briefly, the study examined the utility of perceived risk as an explanatory attribute in selected types of health care decision-making. The primary focus was two-fold: to apply perceived risk measures in an effort to better understand consumer behavior in a given setting and to observe reported risk resolution preferences in a simulated environment.

The study included a measure of general risk propensity and risk perception of various buying decisions, together with selected respondent attributes. All measures were self-reported by volunteer subjects based upon interviews on a judgment sample, except as in the cases reported in Chapter IV.

Risk perception was observed as it related to five products chosen to vary, a priori, in terms of consumer perceptions.

In addition, the study included measures of risk resolution by the same volunteer subjects. Both experimental and control groups were randomly specified from the entire respondent pool. In this manner, the potential confounding effects of uncontrolled variables of consequence were minimized.

The manipulation of the risk dimensions was handled by a factorial design, with all possible combinations
presented to the subject. The degree of the study may be specifically characterized as a post-test with a control group. Respondents were asked to make decisions and report their preferences among several controlled situations both for themselves and as the agent for a significant other.

OBJECTIVES

As should be readily apparent to even the most casual observer, a plethora of research is not a sufficient condition for the generation of an unified, comprehensive theory. Such a dilemma obtains in the case of risk perception and consumer behavior. Still there was enough evidence to suggest that continued effort in this area may be the key to expanded understanding of elusive responses of the consumer. With such a purpose in mind, this study sought to observe the various dimensions of risk perception and resolution in some depth but within a relatively limited sphere, namely, health product perception and behavior. The chiding by other investigators of so-called "reduced-form models," notwithstanding, it seemed reasonable to assume that better long run


6James F. Engel, David A. Knapp, and Deanne E. Knapp, "Sources
progress might be recorded from studying depth rather than breadth. Moreover, such a focus was especially attractive when after much research a theory remains absent.

In specific terms then, the objectives of the study were:

(1) To measure the relative risk dimensions of selected health products. Such measures resulted from the reported perceptions of a sample of respondents.

(2) To utilize the most promising instrument from the published literature which purported to tap general risk-taking propensities with the ultimate goal of further understanding specific respondent perceptions and preferred actions.

(3) To examine the explanatory power of selected respondent attributes and behavior that had shown promise in other studies, vis-a-vis, risk perception and resolution.

(4) To examine the possibility that a selected group of consumers could readily and reliably respond to the risk dimensions of illustrative products.

(5) To examine the resolution of risk by the respondent when confronted with alternative choices in an experimental environment. Alternatives were presented with full factorial control of the desired risk dimensions. Subjects

were randomly assigned to one of four possible groups. Two
groups were control groups, while two groups were exper­
imental. In one control-experimental couplet, respondents
made decisions for themselves, while in the other couplet,
respondents made decisions as an agent for a significant
other in the respondent's personal sphere.

(6) To provide preliminary information concerning the
various attributes of prescribed medicines which subjects
perceived as highly risky. In addition, emphasis was direct­
ed towards specifying preferred strategies for reducing or at
least tolerating risky decisions faced by the sample of re­
spondents. As a result of such analysis, it was felt that a
contribution could be made toward the better understanding of
patient perceptual reactions to various possible drug thera­
pies available to the medical practitioner.

LIMITATIONS OF THE STUDY

Throughout the discussion of the scope and objectives
of the study, the various limitations of the research were
given informal recognition. Several limitations deserve for­
mal recognition.

During the course of the study, no effort was made to
posit a general theory of risk as it relates to consumer
behavior. Further, it was recognized that the results of
this study would represent a small addition to the understand­
ing of the consumer response in the marketplace.
A second limitation pervades all research that must rely on volunteer subjects, namely, the problem of respondent fatigue and its attendant effect upon results. No attempt was made to incorporate all possible measures of risk perception, respondent behavior, or the possible antecedents of perceived risk. To proceed otherwise was to ignore reason and to discard all previous efforts by other investigators. With such a purpose in mind, the research focus was directed toward limiting the number of observations to those which had reasonable expectancy of bearing upon the objectives of the study.

The above limitation, that attributes were finite, meant in the strictest sense the study was not truly experimental in nature. All possible variables were neither measured nor controlled. Therefore, the problem of confounding of results remained evident, as it has in other investigations, and impeded progress toward the development of a comprehensive set of cause and effect inferences. A powerful means of overcoming the problems of systematic bias is through random assignment of subjects to experimental and control groups. Such a method was incorporated into the design of

9 Ibid. pp. 64-66.
the study in an effort to eliminate or at least reduce the confounding of possible observed relationships.

Further, various factors outside the direct control of the author precluded the development and implementation of a national probability sample. Such a limitation obviated the possibility of quantitatively determining the degree of sampling error inherent in the sampling frame. In lieu of the desirable, however, a carefully mapped judgement sample was developed as a superior approach to the convenience or "chunk" sample so frequently encountered in the published literature. Efforts were directed toward the development of a sampling plan which would lead to minimal sampling error, but the caution about attempting to draw global inferences from such a sampling strategy is formally recognized.

Major attention was directed toward identifying and controlling other forms of bias throughout the analysis. Liberal utilization of control techniques helped to minimize the problems of interviewer bias, sequence effects, and methodological artifacts. Further, extensive pilot testing of the study's measurement instruments in a representative sample aided in the control or removal of such systematic error.

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11 Ibid. pp. 31-33.
There remains, however, one phase of the study which lacked an external validity criterion. This phase dealt with the respondents' consideration of several hypothetical antibiotics for personal and use by another, as will be further detailed in Chapters III and IV. For various legal and ethical reasons, there appeared to be no prudent means of allowing untrained laymen to make their own preference choices of actual drugs. The seriousness of an actual medical illness and the attendant liabilities to the author from allowing respondents such freedom precluded a validity measure. The nature of the decision process, however, provided a situation where perceived risk was likely to be high and previous experience low, thus providing an excellent medium for analysis. Vigorous pretesting of all methods and an experimental design, however, allowed for the emergence of content validity.

It was recognized that not all consumer decision-making in the marketplace necessarily leads to overt purposeful action. It is possible for consumers to undertake subversive solutions to buying problems or procrastinate unduly. This study was not sensitive to such outcomes. The nature of the design, where respondents were placed in forced choice situations, obviated the chance of observing the dynamics of a no-go or distorted-go situation related to a consumer's buying dilemma. Such measures, although of great potential value, lend themselves more to field research where the
consumer faces a broader range of possible alternatives. Field research, however, lacks the stricter manipulative control of variables possible in laboratory experimental studies. For this reason, negative or subversive decisions were excluded with the knowledge that such outcomes remain real possibilities in the marketplace.

Finally, it is well to recognize that the results of the study apply to a rather narrow spectrum of consumer decisions and perceptions, specifically in the area of a few health products. From the viewpoint of scientific inquiry and the theory of risk itself, no attempt was or should have been made to generalize the findings into other areas of consumer behavior. To have done otherwise would have bordered on covert misrepresentation of the findings, and may have stimulated development of faulty theory.

OVERVIEW

In the succeeding chapter attention is drawn to previous research regarding the concept of risk perception, especially as it applies to decisions concerning health-connected products (Chapter II). Next, the discussion is expanded to include a conceptual framework for the study where special attention is given to the relationships involving drug decision-making (Chapter III). Using the conceptual framework as a base, an expanded description of the research design and the procedures which were employed is
presented. This discussion includes the general plan for the recording, editing, and analysis of the data (Chapter IV).

The remaining two chapters report the research findings (Chapter V) and the conclusions and implications of the results (Chapter VI).
CHAPTER II

EVOLUTION OF THE PERCEIVED RISK CONCEPT

This chapter examines the research basis that supported the development of perceived risk as a component in the theory of consumer behavior. No effort has been made to undertake an exhaustive review of the total literature in this area. Such an analysis would have introduced duplicative material and generated an independent study which would have transcended the purpose of this investigation.¹ A concerted effort was made, however, to distill the essential elements of previous research in order to provide a direct link with the present study. Efforts of a more tangential nature were excluded except where their inclusion would add substantially to the development of the current study.

ORIGIN

Although the general theory of risk is not new, the origin of perceived risk as a potentially viable focus in

studying consumer behavior in the marketplace occurred in 1960. At that time, Raymond A. Bauer suggested that an element of risk is indigenous to virtually all consumer decision processes. In his pioneering statement, Bauer argued:

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 are likely to be unpleasant.²

One of Bauer's major interests was the way in which consumers resolve or handle the risks perceived in different buying decisions. Further, he noted that, in a majority of purchasing situations, consumers are likely to direct little if any overt attention to perceived risks. Rather, the typical consumer is likely to develop habitual mechanisms which allow for long-term solutions to the risks perceived in making a given product purchase. In effect, Bauer was saying that perceived risk, although possibly confronted at intermittent intervals, does not affect consumer behavior in a conscious, overt manner in the majority of purchasing decisions. Such subconscious mechanisms allow the consumer to purchase on a regular basis without the need to expend time and energy considering and weighing all possibilities and potential outcomes with every purchase.³ Hence the consumer may recognize or perceive risks at the subconscious level but take little


³Ibid. pp. 389-98.
note of them on a day-to-day basis. Bauer explained the mechanics as follows:

In effect I have suggested mainly one device, namely reliance on some outside source for guidance, whether that outside source be the reputation of the manufacturer, an opinion leader, or a reference group.\(^4\)

At no time did Bauer attempt to predict which risk-handling strategies will be invoked by a given consumer in the event that perceived risk exceeds the threshold of consciousness. Moreover, he was careful to point out that the process by which consumers come to place confidence in particular strategies is an important but as yet undefined aspect of risk perception. Further, an understanding of this process will not necessarily result from merely describing and tabulating the varied mechanisms, but will more likely develop by observing and recording consumer behavior in a variety of dynamic frameworks.\(^5\)

Bauer's explanation of the role of perception in the buying process was of considerable importance to the present study.

It should be noted that I have carefully said 'perceived risk' whenever I refer to risk reduction. This is because the individual can respond to and deal with risk only as he perceives it subjectively. If risk exists in the 'real world' and the individual does not perceive it, he cannot be influenced by it.\(^6\)

Once the initial challenge was recorded, several of

\(^4\)Ibid. p. 395. \(^5\)Ibid. \(^6\)Ibid.
Bauer's students proceeded through a variety of investigations to probe the dimensions, processes, and effects of perceived risk in consumer behavior. Of particular merit are the studies which emanated from two notable sources, namely Scott M. Cunningham and Donald F. Cox. Others contributed their efforts in a variety of ways. One of the most salient, in what might be labeled the "Harvard Risk Perception Philosophy," is collected in a major anthology edited by Donald F. Cox. 7

On several occasions, Cunningham and associates attempted to augment Bauer's original work. In addition, Cox has provided input from a somewhat different theoretical focus. Taken as a whole the work of the pre-eminent members of the Harvard Marketing Department is both considerable and enlightening. In brief, the research has yielded the following general observations and tentative conclusions:

(1) Perceived risk appears to be an important consideration in the buying process. 8 Further, the concept, although not fully developed, may eventually prove useful as a major classifying construct. Such potential would therefore

7 Donald F. Cox, ed., Risk Taking and Information Handling in Consumer Behavior (Boston: Harvard Graduate School of Business Administration, 1967).

appear to merit further study.  

(2) General agreement has been reached that perceived risk is a multidimensional construct with a complexity far exceeding what was originally thought.  

(3) Perceived risk can in no way be considered a complete model of consumer behavior.  

(4) In terms of search behavior, consumers perceiving a higher degree of perceived risk associated with a given product are more likely to have discussed the product recently, to have talked with more people about the product, and to have discussed the product in contrast to those consumers perceiving less risk.  

(5) As indicated above, perceived risk appears to be related to word-of-mouth activity on the part of the consumer, but the exact relationship remains in doubt.  

(6) There are different types of risks associated with consumer product decisions. For instance, Cunningham concluded that risk may be perceived in terms of social

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9 Ibid. p. 237.  
consequences, direct economic loss, physical harm or danger, inconvenience or time loss, or simply as a product which is unlikely to perform the intended function. In addition, Cox proposed that the potential harm to a consumer's ego is an additional risk which has important implications for consumers making purchase decisions. Finally, Cox discussed the risk of frustration resulting from a negative purchase outcome. This form of risk appears to encompass elements of what Cunningham termed time-loss and product-failure risk.

(7) Consumers can and do perceive some element of risk, however defined, in the various purchase decisions which they face. In general, consumers are able to readily and specifically enumerate the risks they perceive in buying situations. No conclusions have been recorded, however, as to whether the foregoing observations result from methodological artifacts or are an inherent part of the purchase process. Since these findings have appeared consistently over a diverse range of conceptualizations and designs, it seemed unlikely that variations in methodology alone could account for this phenomenon.

(8) Perception of risk not only varies by product type

16 Ibid. and Cunningham, "Major Dimensions," p. 83.
but also varies according to consumer characteristics.\textsuperscript{19} Moreover, there appears to be a generalized tendency on the part of some consumers to perceive either unusually high or low risk over a broad range of product categories.\textsuperscript{20}

(9) Cunningham conceived of risk as being composed of two relatively independent components, namely uncertainty and consequences. From a strictly intuitive perspective, Cunningham held that consequence is the more salient component of risk. Repeated efforts to substantiate such a contention, however, have failed to produce empirical support.\textsuperscript{21}

(10) From a somewhat different conceptual perspective, Cox defined risk as a function of the amount at stake and the subjective certainty of a win.\textsuperscript{22} Upon inspection both approaches appeared tenable, but the Cox approach appeared to incorporate more directly the perceptual and subjective nature of Bauer's original discussion of perceived risk. In addition, at least one other researcher has drawn the same conclusion having considered both approaches.\textsuperscript{23} On the matter of the salience of the bivariate components of risk, Cox disagreed with Cunningham. Utilizing in-depth studies of two volunteer housewives, Cox argued that the reduction of the uncertainties associated with various product

\textsuperscript{19}Ibid. \hspace{1em} \textsuperscript{20}Ibid. p. 88. \hspace{1em} \textsuperscript{21}Ibid. p. 98.

\textsuperscript{22}Cox and Rich, "Telephone Shopping," p. 33.

\textsuperscript{23}Spence, "Mail Order Buying," pp. 48-49.
alternatives is the more important consumer goal in attempting to confront or at least reduce the perceived risk of a purchase decision. To date the issue remains unresolved.

(11) In any particular purchase situation consumers will not necessarily attempt to reduce perceived risk to an absolute minimum. Instead, they will act to reduce risk to a "tolerable" level but only if the risk perceived exceeds what is deemed excessive by the consumer's personal assessment of the situation.

(12) The risks associated with a given product are unique to that particular product; however, there appears to be a common thread of concern for health dangers which pervaded all product categories examined by Cunningham.

(13) Demographic attributes have proven less than successful as explanatory measures concerning observed variations in perceived risk.

(14) The perceived risk associated with different shopping modes, i.e., retail vs. telephone buying, appears to exert some influence on the consumers' behavior in the

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25 Ibid.


marketplace. In fact, Cox and Rich found that the fear of not getting the desired item, i.e., the risk of frustration and possibly inconvenience, strongly associated with not shopping by telephone in a study conducted in two large metropolitan areas.

(15) Individual consumers typically adopt a group of techniques which allow them the luxury of all but ignoring perceived risks in the majority of their repetitive shopping situations. Further, the means of risk resolution are likely to be unique with a given consumer even when applied over a range of different shopping situations.

SUBSEQUENT EFFORTS

The discussion of perceived risk and consumer behavior has been expanded by other investigators. Such research was, for purposes of discussion, subsumed under two general categories, namely studies treating perceived risk as the major focus, and studies utilizing perceived risk as a facilitating variable in order to address other interests. Both types have merit, and were of interest for the present effort. Of particular note were efforts which dealt with medical decision-making vis-a-vis perceived risk. Necessarily, such research received particular attention.

From the efforts of the Harvard research on perceived risk, two somewhat different conceptualizations of risk have

---

arisen. Cunningham proposed:

Uncertainty can be described as the probability that a given event will occur. Consequences are defined as the cost to the consumer, should the event occur.\(^{31}\)

Alternatively, Cox and Rich described somewhat different components when they discussed the meaning of perceived risk.

The amount of risk perceived by the consumer is a function of two general factors—the amount at stake in the purchase decision, and the individual's subjective certainty that she will 'win' or 'lose' all or some of the amount at stake.\(^{32}\)

In a recent inquiry into the perceived risks of mail-order buying, Homer E. Spence drew a fine distinction between the two approaches. Spence proposed that the Cunningham definition implies that risk is an "inherent state of nature," and that consumers can in some way quantify such risk into objective units of measure.\(^{33}\) While few would argue that life's activities do not involve inherent risks, the Cox and Rich paradigm appeared to more closely approximate Bauer's original statement of the importance of perceiving.\(^{34}\) In that statement, Bauer cautiously pointed out that risks present in the environment are of no consequence to the consumer unless they are perceived.

Although a resolution of the matter exceeded the scope of the present study, the conceptual schism remains. Except where noted, all subsequent research has adopted one


\(^{34}\)Ibid.
of the viewpoints in conducting further inquiries.

Illustrative Research

In a manner not unlike Cox, Spence examined the perceived risk associated with different shopping modes, i.e., mail-order and retail store shopping. Utilizing a quasi-experimental design, implemented in a field study, Spence studied the perceived risk of purchasing hospital insurance through a mail-order mode. Risk was defined as "the amount of risk that a respondent says he sees in a specific buying situation." The results of the study appeared to raise more questions than they answered. For instance, Spence observed that buyers of hospital insurance through the mail mode did not perceive a higher level of risk than did non-buyers who have been solicited by mail advertising. The perceived risk of mail-order purchase, however, was observed to be significantly higher than the perceived risk of retail store buying. Also, respondents who had made a mail-order purchase of the insurance did not perceive a lower rate in shopping for products in general through the mails than did the non-buying insurance group.

Further, Spence found that income appears to mediate the perceived risk of the two shopping modes. As income rose,


risk perception declined. This observation was especially evident for the case of retail shopping. One explanation advanced by Spence was that increased income is highly related to increased shopping sophistication. Increased sophistication leads to reduced perceived risks. In controlling for education, Spence found that perceived risk decreased as the years of education of the respondent increased in the case of retail store buying, but not in the case of mail-order shopping.\textsuperscript{37}

In utilizing a Q-sort technique,\textsuperscript{38} which deals with wholes rather than specific attributes of an object or event, Sommers examined the product perceptions of respondents at various levels of social position.\textsuperscript{39} The single most illuminating conclusion tendered by Sommers was that persons at the extremes of the social class continuum appear to exhibit a significantly higher degree of discrimination concerning the perceived risks of the sample products than do those in the middle range of the distribution.\textsuperscript{40}

On a somewhat negative note, two other researchers classified shopping behavior as it relates to social class and stage in the life cycle, i.e., age, number of children,

\textsuperscript{37}Ibid. p. 368.


\textsuperscript{40}Ibid. p. 206.
It was concluded that "social class distinctions have been obscured by rising incomes and educational levels." In posting such an observation, the researchers raised serious questions as to whether the use of social class and life cycle are warranted in attempting to explain consumer behavior in the marketplace.

The relative effects of social standing on consumer behavior is further clouded by the report of Fry and Siller. In comparing the decision-making process of housewives in two social classes, working class wives and middle class wives, the researchers found several interesting observations. Using four identical breads differentiated exclusively by letters on the packages and marked at various price levels, Fry and Siller found: (1) housewives with a higher educational level were more likely to believe in a price-quality relationship, (2) this belief did not translate into behavior, and (3) although the decision-making process of each housewife group was different, behavior was approximately the same.

In contrast to the findings of the above researchers, work in the public health sector has produced results which are encouraging regarding social class and consumer behavior.

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42 Ibid. p. 48.

Utilizing a four-fold social class index, Green has found that preventive health behavior can be predicted with a fair degree of accuracy. Green's work had special importance to the present effort in that health behavior was a primary concern.

Arndt examined the relationship between sociometric integration and the willingness to adopt a new food product. As have other researchers, Arndt observed that high perceived risk was strongly associated with brand loyalty, which in turn was negatively associated with willingness to try a new product. Information flow as well as discussions and questions about the products tended to flow from those low in perceived risk to those high in perceived risk. In addition, those respondents who possessed a low degree of self-confidence appeared to react to word-of-mouth activity in an ego defensive manner, failing to accept such information as credible.

More importantly Arndt concluded:

Although the relationship between generalized self-confidence and exposure to word-of-mouth was positive and linear, the relationship between generalized self-confidence and the impact of word-of-mouth was curvilinear, with the medium self-confidence group being most responsive.


\[46\] Ibid.
Further, Barach concluded that as generalized self-confidence declines, persuasibility to advertising and other persuasive efforts first increases then declines. In addition, advertising effectiveness was inversely related to product importance or interest.\(^4^7\) Like Arndt, Barach concluded that the medium self-confidence group exhibited the highest degree of persuasive sensitivity.\(^4^8\) This particular study resulted in the observation that persuasibility declined as general self-confidence increased in the case of male respondents but not females.\(^4^9\)

In a subsequent expanded effort, Barach examined the possible interaction of both general and specific self-confidence, perceived risk, and persuasibility. In this instance, the medium self-confidence group again was the most highly persuaded by advertising. Persuasibility, however, declined as product importance increased. Moreover, it was concluded that as the product becomes more important, the influence of specific self-confidence and risk style becomes greater and hence results in decreased persuasibility.\(^5^0\)

The research of Barach included the notion of general risk style. His interest in the measure was derived from a


\(^4^8\) Ibid. p. 315. \(^4^9\) Ibid.

Drawing heavily from past research on categorization width, Popielarz proposed that a generalized willingness to try new products would be associated with a broad categorizing person. Thus the innovative person would likely prefer to make errors of inclusion. On the other hand, a general willingness to not try new products would be associated with a narrow categorizing person. The non-innovator would likely prefer to make errors of exclusion.

Breadth of categorization was therefore proposed as a means of quantifying a general risk style which would likely be active across various purchasing situations. The results of Popielarz's study, although in the predicted direction, were weak. Further, no difference was found between perceived risk and breadth of categorization for males and females.

Two similar developmental streams analogous to that of Popielarz were identified. The first series of efforts directed at refining a measure of general risk style or risk propensity is exemplified by the work of Brim and associates. The second major group might be termed the Kogan-Wallach-Bem risk propensity school of research.

Brim's original work and subsequent hypotheses


52Ibid. p. 369. 53Ibid. p. 370.
resulted from exploratory work on the psychology of attitudes. In essence, Brim et al. focused on what they termed the desire for certainty. This so-called personality dimension was described as a type of attitude composed of content as measured by direction and intensity. It was assumed that individuals have a generalized desire for security and certainty in their daily activities. Moreover, in order to achieve a reasonable degree of cognitive certainty, the individual would be inclined to exhibit a marked tendency to deny ambiguity. This tendency would be especially evident when the individual exhibited a high desire for certainty.

Finally, individuals could be expected to vary in this desire for certainty, but the attribute would remain fairly stable across situations but within people.

In attempting to substantiate the above contentions, and after repeated efforts, Brim et al. developed a thirty-two item scale. The scale purports to quantify the desire for certainty attribute. Initial development was done by Brim, with further refinement completed by Brim and Hoff.  

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55 Ibid. 56 Ibid. pp. 68-70. 57 Ibid. pp. 68-75. 58 Ibid. p. 75.
In brief the scale is composed of thirty-two statements about common thoughts of everyday life. The intent is to produce a single index which will give a reliable indication of the respondent's desire for certainty. Brim documented that the results appear to be normally distributed in the population, and that this desire or felt need for certainty varies substantially across people. In utilizing the scale as an explanatory measure of inter-subject intra-product perceived risk, it has been assumed that variations in perceived risk may disappear when the person's desire for certainty is controlled.

In two studies, one by Brim and Hoff the other by Cunningham, a major conclusion was "that subjects who tend to perceive risk in one product area also tend to perceive risk in other product areas." This observation from two relatively independent sources lends support to Brim's supposition that a general desire for certainty influences the assessment of risk over a range of situations.

Over the past several years, the Desire for Certainty Scale has undergone intensive testing. Reliability coefficients, using the Spearman-Brown formula and odd-even split technique, have averaged close to 0.81. In addition, 

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61 Brim and Hoff, "Differences in Desire for Certainty," p. 228.
large scale testing by Brim and Hoff appears to substantiate the argument that desire for certainty is unrelated to either socioeconomic status or intelligence. Further, a frequency plot of over five hundred returns indicated that the attribute is normally distributed in the population.

It is unfortunate, however, that the Desire for Certainty instrument has been tested almost exclusively in convenience samples of college students. Little actual experience exists on the utility of incorporating the scale into general population studies, or the effects of using the scale in concert with other instruments.

The research literature of risk perception provided evidence of alternative means of identifying general risk propensities. Initial development of the alternative means was completed by Kogan and Wallach. Their scale, known as the Choice Dilemmas Questionnaire (CDQ), has been incorporated in studies of group and individual decision-making. Additional work has included the CDQ, but the research scope has been expanded to include the mediating effects of the judged

63 Brim and Hoff, "Differences in Desire for Certainty," p. 225.
64 Ibid.
65 Ibid.
consequences of failure if a bad decision is made, the changes wrought when the respondent decides for himself as opposed to making a decision as an agent for a second party, and the effects of the decision importance and decision control on risk preferences and decision results.

As originally constituted, the Choice Dilemmas Questionnaire was composed of twelve vignettes each describing a different character and situation. The method is based upon respondent decision-making under the aegis of advising the central character in each dilemma presented. Implicit in the use of the instrument is the assumption that the respondent will reliably input his own subjective willingness to undertake risks as he resolves each dilemma.

In each dilemma the protagonist faces two courses of action: one is a relatively "safe" but low payoff choice, the other a more "risky" but higher reward choice. It is explained to the respondent that the central figure prefers the riskier course of action in each dilemma. Then the respondent is told that the protagonist has asked for advice. Finally, the respondent is asked to indicate, by means of

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70 Wallach, Kogan, and Bem, "Group Influences," pp. 75-86.
checking an "odds" figure, the minimum chance of success he would demand before recommending that the riskier choice be undertaken. The respondent may indicate 1, 3, 5, 7 or 9 chances in 10 as the minimum odds which are acceptable. In addition, the respondent may recommend that he would not accept the more risky course of action under any circumstances. 71

Since the original CDQ was developed, Wallach and Wing have reduced the number of dilemmas to six with no apparent loss of reliability. 72 Additionally, Fleming has modified the CDQ slightly to allow for comprehension over a greater range of socioeconomic positions and educational abilities. 73 The changes introduced by Fleming consisted of selected word replacement with more universally understood phrases so that the job alternatives would have meaning for more respondents.

In making such changes, Fleming hypothesized that risk taking propensities could be expected to vary not only across subjects, but also across socioeconomic class. 74 In comparing the risk acceptance among literate welfare recipients with that of college students, Fleming found that "a person's social position in society may greatly influence his interpretation of the desirability of alternatives." 75 Secondly, Fleming concluded that "a person's position in society may

71 Wallach, Logan, and Bem, "Group Influences," pp. 75-86.
73 Ibid. pp. 67-76. 74 Ibid. pp. 67-68. 75 Ibid. p. 74.
greatly affect his perception of the uncertainties of actually attaining the desirable outcome. \(^76\) Moreover, in cases where the protagonist within the dilemma will not shoulder the blame for failure, the risk acceptance level of both groups was identical. \(^77\)

As chances of success required before the respondent will recommend accepting the riskier alternative increases, the respondent's willingness to accept risk becomes lower. Scoring is based upon the subject's "chance of success" indication for each dilemma. For instance, a response indicating recommending acceptance when the chance of success is 1 in 10 is scored as one, 3 chances in 10 is scored as three, and so on. The total rejection alternative is scored as eleven. The scores are summed over all dilemmas and then averaged. The higher the resulting score, the less the willingness to accept risk. \(^78\)

In studying the CDQ over a sustained period, Kogan and Wallach applied the method in a variety of settings with a variety of respondent types. Spearman-Brown reliability coefficients using split halves have resulted in coefficients ranging from 0.53 to 0.80, "suggesting that the instrument possesses satisfactory internal consistency." \(^79\)

\(^{76}\) Ibid.

\(^{77}\) See Items 2 and 5 in Appendix A and Wallach, Kogan, and Bem, "Group Influences," p. 71.


\(^{79}\) Wallach, Kogan and Bem, "Group Influences," p. 78.
In noting that conservative responses tend to increase with age for both sexes, the researchers have concluded that the construct validity of the Choice Dilemmas Questionnaire as a risk taking measure over many studies appears "consistent with a risk taking interpretation."\(^80\)

Other researchers have examined the consumer as a decision-maker operating within different situations. Swan argued that consumer information search is a function of the degree of conceptual conflict perceived to be associated with the purchase.\(^81\) The conceptual conflict which stimulates increased information search behavior is affected by the uncertainty of the situation. Further, uncertainty is a function of the number of alternatives present, the relative strengths of the alternatives, and the incomparability of the outcomes of the various choices.\(^82\) This hypothesis remains unproven in that Swan's sample type and size prevented any generalization of the results.

From an investigation of product innovation behavior and general risk taking style, Sheth and Venkatesan attempted to explain repetitive consumer behavior as a means of risk reduction. In that study the authors argued that consumers make purposeful effort to reduce perceived risk. Such methods include information seeking which is a form of search

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\(^80\) Ibid.


\(^82\) Ibid.
behavior as defined by Swan. In seeking information consumers may question friends and relatives, seek external sources of authoritative information, read advertising, or rely on trusted salesmen. In addition, the consumer may undertake extended prepurchase deliberation or simply repeat previous behavior.

In conducting a time series study, Sheth and Venkatesan examined the development of patterns of preference of various risk-reducing methods. The results of the study included the following:

(1) Prepurchase deliberation tended to decrease over time. This observation held whether respondents considered a well-known brand or a relatively obscure brand.

(2) Prepurchase deliberation was higher for respondents considering the lesser known brand as opposed to a nationally known brand.

(3) Both respondent groups actively sought information, supporting the authors' arguments.

(4) Respondents in the higher risk group, those considering the obscure brand, tended to prefer personal sources of information at a much higher rate than did respondents in the low risk group.

(5) Repeat purchasing increased over time for both

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respondent groups.

(6) Repeat purchasing increased at a significantly slower rate for the high risk respondent group than the low risk group. 84

Although Sheth and Venkatesan argued that perceived risk is a necessary condition for the development of brand loyalty, and the existence of a strong national brand the sufficient condition, 85 such conclusions may be premature. Without conclusively ruling out other variables, the researchers have ignored a crucial requirement before concluding cause and effect.

In another effort involving product innovation and consumer behavior, Ostlund attempted to define which product perceptions most affect consumer behavior. In justifying his approach Ostlund argued:

. . .it is not at all clear what perception dimensions are used by consumers in appraising new products, nor if these dimensions are applicable over a variety of product categories. 86

Ostlund chose low-priced products so as to minimize the probability that consumer choices would be joint husband and wife decisions. Because a "mixture of feelings was found to exist in the literature," 87 only a select few demographic variables

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84 Ibid. 85 Ibid.
87 Ibid. p. 262.
were included in the study. Utilizing six product dimensions and the respondent's reported willingness to purchase illustrative new products, Ostlund concluded that perceived risk provided the best explanation of innovative willingness.  

The reported relationship, however, was only moderate with a higher degree of innovative willingness being associated with a low degree of perceived risk.

In a second study Ostlund discarded the product perceptual attribute approach and sought to explain innovative willingness in terms of respondent self-confidence. In addition to recording willingness to purchase an innovative product, Ostlund also measured problem-solving self-confidence, psychosocial general self-confidence, and specific self-confidence related to particular products. The results of the study are distinguished by the fact that few stable relationships were observed.

From another perspective, Granbois concluded that there appears to be substantial variance in the way consumers make decisions. Further, in order to achieve maximum understanding, research should necessarily be directed toward measuring three aspects of the purchase decision. According to Granbois, the three foci include: the type product under consideration, the situational aspects of the decision, and the characteristics

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88 Ibid. p. 263. 89 Ibid.

of the decision-maker. The situational factor, as represented by "perceived uncertainty," was proposed by Granbois as being extremely important. From the description, "perceived uncertainty" translates approximately into perceived risk.

Having suggested fruitful avenues of investigation, Granbois proceeded to enumerate the various conditions which, if present solely or in combination, would lead to high levels of "perceived uncertainty." In brief the conditions are:

(1) When the consumer making the decision has little or no previous experience, or previous experience is perceived as being outdated.

(2) When the product under consideration is entirely new and no previous experience is recorded anywhere.

(3) When past experience with the product has been unsatisfactory.

(4) When the purchase is discretionary rather than necessary.

(5) When a correct or "right" decision is crucial as in the case of a gift.

(6) When the purchase decision is likely to be socially visible.

(7) When all alternatives have both positive and

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92 Ibid. p. 52.
negative consequences which are evident to the decision-maker.

(8) When family members disagree as to the preferred choice.

(9) When purchase behavior which is contemplated is likely to diverge from the behavior of the desired reference group.

(10) When the consumer perceives important changes in the political or economic environment. Finally, Granbois proposed that much is to be learned from an examination of purchase decisions of the singular consumer and the family as a unit.

In an interesting study utilizing price information and store image, Enis and Stafford examined the perceptions of quality for various carpeting. Respondents were college students with minimal experience for the product category. Utilizing two informational inputs, price and store image, the researchers concluded that price and quality appear to be related on a perceptual plane and that information regarding store image seems to act as an intervening variable between price and quality.

Enis and Stafford expanded their efforts in a subsequent study to include three distinct sample groups. By

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[93] Ibid. pp. 53-54. [94] Ibid. p. 55.

choosing respondents who were students, housewives, and carpet experts, the researchers were able to vary the expertise of the respondents by design. In addition to the conclusions tendered in the first study, Enis and Stafford found that the perceptions of the various groups varied significantly. Thus research which is based solely on student populations is open to serious question regarding sample representativeness. 96

Another approach to studying the relationship between brand loyalty and product quality is represented by the studies of McConnell. His methods included factorial design, field implementation, and longitudinal measurement. Utilizing price as a surrogate for quality, McConnell recorded the development of brand loyalty over a sufficient amount of time to propose several intriguing hypotheses. 97 Brand preference developed at a fairly rapid rate. The perceived quality of the product choices explained approximately two to three times the variance as did time. Deliberate buyer behavior appeared to exist, and respondents tended to establish second and third preferred choices. This observation supports the hypothesis that brand loyalty may exist for a group of brands as opposed to a singular brand. The price reductions introduced into the design were perceived as shopping cues and did


produce purchasing effects, but the positive effects of price concession dissipated rapidly with time.$^{98}$

In a similar study McConnell used a factorial design to examine the perceptions of an entirely homogenous product. Beer from a single brewing run was bottled and labeled randomly with four prices. Respondents then made purchase choices over several weeks with price being the only differentiation of the various bottles.$^{99}$ McConnell concluded that respondents did use price as an indicator of quality. The relationship between price and the perceived quality of the four beers was positive although non-linear.$^{100}$ These findings, therefore, support McConnell's earlier work, but the finding of non-linearity is unique to the second study.

In a related effort Roselius examined the relative preferences for a variety of risk-reducing mechanisms when the respondent was confronted with each of four types of risk. These types included time loss resulting from a negative decision outcome, hazard loss or the danger of physical or health damage, ego loss as represented by the foolish feeling resulting from purchasing defective products, and monetary loss. Regardless of the type of loss considered, brand loyalty and purchasing a major brand were consistently ranked

$^{98}$Ibid. p. 18.


$^{100}$Ibid. pp. 301-02.
first and second, respectively, as the preferred means of reducing risk. Further, brand loyalty was preferred substantially and significantly more than buying a major brand. The relative preference for brand loyalty as a means of reducing risk was highest for risks of monetary loss, followed in descending order by ego loss, hazard loss, and time loss. At the opposite end of the spectrum, purchasing the most expensive brand was consistently the least preferred means of reducing risks. In the end Roselius concluded that "buyers generally favor some risk reducers and are relatively unimpressed with others."  

Although McConnell concluded that product price and quality appear to be related perceptually, Roselius found that purchase of the most expensive brand was consistently the least preferred means of risk reduction irrespective of the type of risk. The exact relationships among product price, quality, and risk reduction is unclear. It may be that consumers will use price as an indicator of quality which becomes a means of reducing perceived risk in the absence of other product cues. When other means are available to reduce perceived risk, price declines as the preferred method of avoiding negative consequences.

The universality of perceived risk implications may be present at other marketing levels. For instance, McMillan

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has completed a study of risk perception in the industrial chemical market. In pointing out that little consensus exists regarding the appropriate research definition of risk, McMillan proposed that "the proper risk for research purposes is that which is subjectively felt, rather than that which is objectively defined." 102

In a well-conceived study, McMillan asked persons most directly involved in purchase decisions to rate a list of vendors along three groups of characteristics. Thus chemical buyers were asked to rate various aspects of the vendor company, the salesmen, and the products. Upon completing the mail study, McMillan concluded that industrial consumers, as represented by those responsible for purchasing decisions, do perceive differential risks among various supply firms. Further, non-buying firms perceived a higher level of risk associated with the elements of a given supplier than those who actually purchased from the particular supplier. Finally, it was observed that "In every comparison, the highest mean perceived risk was directed towards the salesman." 103 Hence, McMillan's study provided initial evidence that industrial consumers perceive and react to differences in risks associated with various suppliers, products, and salesmen, 104 as does the singular consumer.


Efforts to relate specific personality dimensions to consumer behavior and risk perception have not yielded strong results. A recent study by Herbert E. Brown probed the role of personality and perceived risk. Using branded headache remedies and cold remedies as illustrative consumer goods, Brown was unable to demonstrate that the personality dimensions utilized varied concomitantly with perceived risk. As with the Popielarz study cited above, Brown was able to conclude that category width, as a measure of general risk willingness, was inversely related to reported willingness to purchase new brands of the two products tested.

Although Brown's study provided little understanding of the interrelationships between personality and risk perception, other researchers have recorded somewhat more encouraging results. Utilizing perceived risk as a mediating variable, Mazis and Sweeney studied the potential relationships between several personality dimensions and the desire for new or novel products. The study was implemented using a convenience sample, and the researchers recorded


106 Brown, "Role of Personality," pp. 250-52. 107 Ibid.

subject willingness to purchase new forms of four hypothetical products. In addition, Mazis and Sweeney measured several personality dimensions which appeared promising from previous research efforts.\(^{109}\)

Results were not consistent across products or personality measures though several relationships were moderately strong. Intentions to purchase a new car, a product with high social and economic risk, were positively related to measures of dogmatism. Intolerance for ambiguity, which appears to closely resemble the Brim Desire for Certainty measure, was inversely related to reported intentions to purchase new forms of underarm deodorant and soft drink. As scaled by the sample respondents, underarm deodorant represents a product with high social but low economic risk; whereas, soft drink is a product with low social and economic risk.\(^{110}\) In addition, the researchers proposed that economic risk represents a more salient concern for the consumer than does social risk.\(^{111}\) Although little was found to refute such a claim, repeated reading of the Mazis and Sweeney research has failed to produce a readily apparent basis for the hypothesis.

Several researchers have maintained that personality studies have produced dismal results not because of an inherent lack of validity, but because the majority of the scaling instruments have been borrowed from clinical psychology.\(^{112}\)

\(^{109}\)Ibid. pp. 408-09.  \(^{110}\)Ibid. p. 407.  \(^{111}\)Ibid. p. 410

Such techniques were originally designed for diagnostic purposes far removed from typical consumer processes. In addition, many analyses have utilized bivariate analytic procedures which imply that personality traits exist as definable entities. Further, such methods imply that such traits exist in mutually exclusive perceptual space, and, therefore, do not interact. Consequently, both the instruments of measurement and the subsequent analytic methods contribute to confounding of the results.\(^{113}\)

By using a multivariate analysis on data derived from specially developed personality measures, the researchers were able to demonstrate moderate relationships between selected personality constructs and consumer behavior.\(^{114}\) Although the results did not add substantially to an understanding of personality and consumer behavior in the marketplace, the method may represent potential for future research on personality.

Unlike the study reported above, Brody and Cunningham argued that personality research has suffered from not specifying the conditions most likely to produce personality effects on consumer behavior.\(^{115}\) Thus the best approach for

\(^{113}\)Ibid.

\(^{114}\)The research analysis was conducted using canonical analysis which allows for and maximizes the coefficients of interaction among several variables. Worthing, Venkatesan, and Smith, "Explorations of Personality," p. 366.

\(^{115}\)Brody and Cunningham, "Personality Variables," p. 50.
continued research on personality involves a specification of such conditions. It was proposed that risk-reducing activity, which represents consumer personality, is more likely to be invoked at the high end of a perceived social risk continuum. Further, such activity on the part of the consumer would be enhanced if the perceived performance risk of the product was also high. Finally, risk-reducing energies would be likely if the specific self-confidence to judge a particular product was perceived as being low by the consumer.

In other words, risk reduction activity becomes important when the consumer perceives important differences between various brands of a product, i.e., high performance risk; when he feels unqualified to judge differential quality, i.e., specific self-confidence low; and when he perceives social risk to be at its zenith.

Brody and Cunningham suggested that research should be continued on personality dimensions and consumer behavior with regard to perceived risk. Moreover, it was proposed that the most fertile area for future effort lies in studying products which vary considerably in terms of perceived social and product performance risk, and where consumer specific self-confidence is likely to be dramatically different.

116 Ibid. pp. 50-52. 117 Ibid. p. 50.
Drug-Physician Studies

In discussing the implications of perceived risk and physician preference for various risk-reducing techniques, Bauer and Wortzel maintained that physicians vary in their preferred sources of information for prescription drugs. Further, the amount of information, i.e., the magnitude of search behavior, is affected by the attributes of the disease to be treated and the particular characteristics of the drug under consideration. In other words, the preferred choice of information about a particular drug is a function of the perceived riskiness of both the disease and drug. Further, as the riskiness of the drug increases, the physician is increasingly likely to prefer non-company sources of information.118 Bauer and Wortzel explained the hypothesis as follows:

If the condition which the drug is designed to treat is neither severe, nor the action of the drug particularly uncertain, the amount of information provided by commercial channels may be sufficient . . . As the severity of the illness increases, and the treatment becomes less well understood, more information is needed before prescribing . . .119

In a later effort, Bauer maintained that new prescription drugs may well represent potential benefits to therapy, but may also represent considerable threat to both patient and physician. The period of time immediately following market


119 Ibid. p. 46.
introduction represents the time of highest indeterminacy, but such uncertainty includes only one aspect of the risk involved. The magnitude of prescribing consequences should also be assessed in order to fully develop the risk dimensions.120

In utilizing a convenience sample of over four hundred physicians attending a medical convention, Bauer asked the doctors to indicate their preferences for several pharmaceutical manufacturers, preferred choices of drugs for both mild and severe diseases, and the degree of previous trial for several drugs from different manufacturers.121 The illustrative drugs utilized in the study were classified into two groups according to their usual therapeutic responses. Drugs in the first category included those which typically produce spectacular results but also are risky in terms of serious side effects. The risk of adverse reactions is especially evident when the drugs in the first group are utilized in chronic disease therapy. On the other hand, drugs in the second category included those typically considered to be relatively safe but only produce dramatic results at times.122

The results of Bauer's work provided additional evidence of the effects of risk perception. Bauer concluded that a marked relationship appeared to exist between company preference and preference for a given drug. The relationship


121 Ibid. pp. 531-32  122Ibid. p. 531.
was evident whether the disease condition under treatment was mild or severe. Company preference also appeared to be related to having previously used the drug, but the exact relationship between the two conditions was unclear.\textsuperscript{123}

Further, company preference, as measured by reported favorable attitudes toward selected pharmaceutical manufacturers, apparently influences whether a particular drug will be tried, but the effect appeared to rapidly dissipate with the passage of time from market introduction.\textsuperscript{124} In the final analysis the results of Bauer's work "suggest that the element of risk reduction (i.e., company preference) plays an important role in the instance of 'risky' drugs."\textsuperscript{125}

In a major study Coleman, Katz, and Menzel utilized a hypothetical new drug to examine patterns of innovation in drug prescribing by physicians. The drug represented a variation of a firmly established class of prescription drugs, as opposed to a major technological innovation.\textsuperscript{126}

In observing the behavior of the sample physicians, the researchers noted several interesting relationships. Physicians with shared offices were more likely to be drug innovators than were physicians occupying singular office suites.\textsuperscript{127} Such an observation did not explain, however,

\textsuperscript{123} Ibid. p. 533. \textsuperscript{124} Ibid. p. 539. \textsuperscript{125} Ibid. \textsuperscript{126} James Coleman, Herbert Menzel, and Elihu Katz, "Social Processes in Physicians' Adoption of a New Drug," \textit{Journal of Chronic Diseases} 9 (January 1959) pp. 1-2. \textsuperscript{127} Ibid. p. 5.
whether innovative behavior resulted from the increased awareness of newer drugs because of the close proximity, or whether the close proximity allowed for increased confidence and shared blame as aids to the adoption of innovative office procedures.  

The strongest relationship observed was that physicians who were socially integrated into colleague networks were more likely to be early adopters of the new drug. This effect appeared to be most pronounced at the earliest stages of introduction. Again, it was unclear whether innovation resulted from increased awareness through social integration, or whether being socially integrated allowed the physicians increased colleague validation. The researchers proposed the following:

... it is only in the early months after the drug's appearance that a doctor needs the support and judgements of his colleagues. It is chiefly when a drug is new that a doctor who is to adopt it needs his colleagues to confirm his judgment and to share the feeling of responsibility in case the decision to adopt the drug should be wrong. At this time, familiarity with the new drug is minimal and the doctor is in an uncertain situation.  

As the illness physiology becomes increasingly indeterminate, the degree of certainty surrounding appropriate treatment decreases. The need for colleague validation appeared to become even stronger with the consideration of less well understood disease conditions. Moreover, professional sources

of information grew in importance with the increasing inde-
terminancy of the disease under treatment. 133

In a somewhat different interpretation of the same
research, Menzel argued that innovative physicians actually
represent the most socially integrated and socially accepted
physicians in a given medical community. The basis for inno-

vative behavior proposed by Menzel was as follows:

. . . it is proposed that the locally well-
integrated physicians were early drug adopt-
ers because local integration itself afforded
them a high flow of communication about the
new drug; and that they were not deterred
from adopting it by their adherence to local
norms because those local norms, far from
opposing the adoption of this innovation, actu­
ally favored it. 134

If such an argument is viewed in light of the findings re-
garding risk taking behavior of groups, much similarity ex-
ists. The view assumes that innovative prescribing behavior
at the early stages of market introduction represents a "less
safe" course of action than the utilization of traditional
drugs. Under such circumstances, group support in the form
of colleague networks allows for a shift towards more risky
behavior. Thus the "risky-shift" phenomenon of group
decision-making as identified by Zeleska and Kogan is con-
gruent with the observations resulting from the work on drug
innovation behavior. 135

133 Ibid. p. 18.
135 Zeleska and Kogan, "Level of Risk," p. 198; and Menzel,
In seeking to expand the understanding of the effects of perceived risks and benefits of various drugs available for prescribing by physicians, Knapp and Oeltjen constructed four theoretical yet realistic patient case histories. In each case history the demographic attributes of the patients were essentially the same, but severity of the disease varied.136

"A hypothetical, but realistic, description of a drug was constructed...."137 The description included a generic name, the indicated usage, action, all warnings, dosage forms, and how the drug was supplied by the manufacturer. Physicians representing four specialty types were then asked to pair-compare the effects on the patient case under varying conditions of expected benefits and side effects.138

In total, four decision factors were utilized in assessing the relative importance to physician decision-making. The factors included expectancy of benefit, the amount of benefit to be gained, the expectancy of side effects, and the side effect magnitude.139

When the disease severity was low, internists, both board certified and non-certified, exhibited more concern


137 Ibid. p. 1347. 138 Ibid. 139 Ibid. p. 1346.
for the beneficial aspects of the drug; whereas, general practitioners and osteopathic physicians were more concerned with the side effects. As the disease severity was increased the concerns of the two groups of physicians exactly reversed themselves. Thus the researchers concluded that the seriousness of the disease under consideration and the physician type both appear to affect the interpretation of benefits and risks in assessing possible drug therapy. 140

Some effort has been directed toward identifying patterns of behavior of consumers when shopping for patent medications. One such study, completed with individual consumers, involved purchasing behavior and information sources.141 It was found that product usage was considered to be highly risky if the particular non-prescription drug had not been extensively advertised. Further, the study respondents seemed to react more dramatically to reports of negative consequences of patent drugs. Reports of others' experiences and published health articles about patent medications, therefore, served as a negative influence on purchasing behavior. Respondents were motivated to avoid the drug rather than try it.

Although there were wide individual differences in the perception of risk, perceived risk appeared to be significant:

140 Ibid. p. 1347.

throughout all interviews. Again, respondents relied heavily on brand names as a means of reducing risks. Once the respondent perceived a brand name to be acceptable, price shopping among different outlets was undertaken without fear of purchasing an inferior or dangerous product. Unfamiliar brand names were perceived as being quite risky, unless specifically endorsed by a health professional.\textsuperscript{142}

The final study of interest was completed by Engel, Knapp, and Knapp. In noting that there appears to be a virtual absence of information relative to how consumers arrive at decisions concerning self-medication therapy, the authors undertook to examine such consumer behavior dimensions.\textsuperscript{143}

As with the previous study, well-known brand names were utilized by respondents as important risk-reducers. More importantly, the results indicated that a substantial degree of perceived risk exists when the consumer lacks specific knowledge about the drug. The concern of the respondents was translated into a fear that a wrong, and thus harmful decision, would likely result when decisions to purchase were made in the absence of specific knowledge of the drug under consideration.\textsuperscript{144}

\textsuperscript{142}Ibid. p. 461.


\textsuperscript{144}Ibid. pp. 777-78.
CHAPTER III

CONCEPTS AND RELATIONSHIPS

This chapter will review in some detail the development of the conceptual framework regarding the meaning of perceived risk which is indigenous to the entire analysis. In addition, this chapter outlines the dimensions of drug decision-making important to the study. To further the understanding of the methods and design, potential utilities of the research are discussed. Finally, specific a priori hypotheses are set forth which were tested in the operational and interpretative phases of this study.

CONCEPTUALIZATION OF RISK

Perceived risk was conceived of as having two distinct yet relatively independent dimensions—uncertainty and consequence. Uncertainty is a measure of the perceived probability that a given event will or will not occur; whereas, consequence is a measure of the results of a given event once it has occurred. In this regard, consequence may be both negative and positive. For instance, the positive event associated with buying a steak dinner is that the food fulfills a need for sustenance. Failure of the dinner to completely fulfill its purpose represents the risk of a positive event
not occurring. A negative dimension of consequence also may exist for the same steak dinner. Furthermore, the negative and positive events are not mutually exclusive. That is, a negative outcome such as an upset stomach or indigestion, may occur while the positive event, fulfilling hunger pangs, is also manifest.

Perception was viewed as a process which bears upon categorization or grouping of reactions to a percept, viz., a thing, an event, or a relationship. Perception was seen as being a higher order activity than mere sensation, in that some form of elaboration and organization takes place in the cognitive centers.

As such, perception was considered as an integrated activity in which sensations are transferred to the cortical centers, processed, given meaning, and finally categorized. Additionally, perception transcends virtually every aspect of mental activity. Such activities include action responses, memory, experience, emotion, thinking, and motivation. Perception then is an extremely complex phenomenon, which for


purposes of this study was treated as a global construct. This focus, to treat perception as a singular concept, grew out of the present interest in perception and its relationship to consumer behavior.

Finally, it is helpful to recognize that perception appears to possess a cultural component which is to say that identical percepts will not necessarily be perceived alike by people of varying cultures. This observation alone mitigates the utility of transferring research findings intact from one cultural sample to another. Moreover, this caveat is further exacerbated by the possibility that such an apperceptive phenomenon may also exist among various sub-cultures within a singular culture. In this country, however, there is some evidence to suggest that sub-cultural differences are beginning to disappear. In any event, the potential confounding effects of cultural antecedents were considered in the design of the study.

The concept of risk is without consensual agreement in the literature. As should be evident from the discussion

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in Chapter II, the notion of risk has evolved from a uni-
dimensional to multidimensional construct. This richer
measure, however difficult to manipulate and observe, appeared
more realistic in light of evolutionary development. More­
over, even a terse dictionary definition alludes to at least
a two-dimensional notion of risk.\(^9\)

The concept of risk indigenous to the remainder of the
study derived from what might be called the "Harvard Risk Per­
ception Philosophy," i.e., risk is composed of both a proba­
bility and outcome dimension.\(^10\) The probability dimension was
envisioned as the degree of uncertainty, the amount of unsure­
ness, the degree of indeterminacy, or the obverse, the degree
of certainty that a given event will occur. The outcome di­
mension was thought of in terms of peril, danger, loss, or
hazard. However, consequences may also take the form of posi­
tive outcomes or events. An example of the former type of
outcome, a negative event, might be the development of dis­
cernible side effects from the administration of penicillin;
whereas, a positive outcome could be anticipated if that same
penicillin would actually produce the intended curative ef­
fects. Again, the positive and negative event possibilities
are not mutually exclusive, and the overall risk attached to
a given course of action was viewed as being the net result

"risk."

\(^10\) Supra, p. 17.
of the chances of positive and negative events.

Risk, as treated in this study, was a negative construct composed of both probability and outcome. Therefore, the conceptual model was restructured to emphasize this viewpoint. In addition, four primary assumptions supported the conceptualization of the study.

These assumptions include:

(1) Risk is a property of an alternative. The risk property affects the choice of alternatives.\(^{11}\)

(2) Alternatives can be ordered reliably with respect to their riskiness.\(^{12}\)

(3) The risk property of an alternative is an undefined function of the variance of the outcomes.\(^{13}\)

(4) The risk property of an alternative is an undefined function of the magnitude of the outcomes.

The risk ordering that may be generated was seen as "a linear combination of expectancy and variance."\(^{14}\) The function represented an additive model which was supported by little empirical evidence. Until such time as adequate documentation is developed to either support or refute such a relationship, an additive conceptual model appears more readily defensible.

It can now be stated that for purposes of the study the riskiness associated with a decision to acquire a particular product was viewed as a function of the probability


\(^{12}\) Ibid. \(^{13}\) Ibid. \(^{14}\) Ibid. p. 547.
that beneficial or expected outcomes will not occur and the probability that negative or unwanted outcomes will occur. Bauer alluded to such a framework in studying physicians' preferences for pharmaceutical manufacturing firms under varying degrees of drug and disease risk. In addition, Knapp and Oeltjen utilized an almost identical theoretical model in analyzing benefits-to-risks ratios in physician drug selections. Their model is as follows:

\[ \text{Risk} = f(\text{expectancy of benefits, amount of benefits to be gained, the expectancy of side effects, the side effect magnitude}) \]

Mathematically, the theoretical relationships may be expressed as:

\[ \text{Risk} = f(P_b, B, P_n, N) \]

Where \( P_b \) = the probability of expectancy of benefits
\( B \) = the benefits to be gained
\( P_n \) = the probability or expectancy of negative results
\( N \) = the negative or hazardous outcome.

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17 Ibid.
In the context of the present study, the relationship was rewritten to emphasize the "net risk" associated with consideration of both the benefits and the risks to be expected. The equation then became:

\[ \text{Risk} = f(P^b, B) - f(P_n, N) \]

To further emphasize the negative aspects of the conceptual model, the expectancy of benefits was restructured to the expectancy of benefits not occurring. If the probability of all possible events is unity or 1, and \( P^b \) represents the probability of the expected or hoped-for-event, then \( 1 - P \) becomes the probability that the expected benefits will not occur. Implicit in the argument were the assumptions that there exists only one positive event, and that all gradations of the positive event are included in the \( P^b \) term. The theoretical model then became:

\[ \text{Risk} = f(1-P^b, B) + f(P_n, N) \]

At this point it is useful to expand the discussion to place the conceptual risk model into a broader framework. The more comprehensive model which appeared to most closely approach the intent of the adopted risk model was the one proposed by Engel, Kollat, and Blackwell.\(^{18}\) Called the decision-process model, it is reproduced in Figure 1.

The basic composition of the decision-process model is that of a closed system of motivation and behavior that

serves as a general theoretical model of consumer decision-making (see Figure 1). In essence, the model views consumer activities in the marketplace as a series of interrelated paths that connect multiple decision points. By examining the various connecting links, it is possible to theorize a wide variety of explanations concerning consumer motivation and behavior.

Although the model was posited as a dynamic process, the framework was viewed as being operative only to the extent that the consumer recognizes a problem as requiring attention. Hence, the model does not explicitly deal with the factors that lead to the need arousal that a problem is at hand. In other words, this study was not concerned with whether the recognition of need occurs as a result of noticing that the current inventory of goods is depleted or whether it is from need triggered by perceived reminders or promotions in the consumer's environment.

Further, no direct attention was paid to whether the consumer possessed the wherewithal to activate a decision once it was made. For example, no allowance was made for a consumer's fiscal reserves or available credit reserves, and the possible effects upon the decision process. The rise and fall of available fiscal means, including the proximity to a payday and upcoming financial commitments, would appear to have some effect upon the purchase process decision. Such an event was given implicit recognition with the inclusion of
Figure 1

Consumer Decision-Process Model
the "halt" option exiting from the "purchase process" decision point (see Figure 1). However, it should be recognized that the temporal sequence of purchasing was not the major focus. Further, for purposes of examining consumer decision processes, the fact that current fiscal means are absent would in many cases delay the purchase rather than cancel it. This argument, of course, assumes that the need is of sufficient strength so as to require action at some point in time.

It can be argued that a consumer's relative economic position in society may impart effects on the perception of risk. Thus, as income rises, risk perception decreases. This possibility was recognized by the adoption of price as a variable in examining risk perception. Further, the possible impact of income level may be related to a decrease in relative economic consequences because greater income allows the buyer additional discretion to make a second purchase if the first proves unsatisfactory.

The products chosen for this study, however, are characterized as being at the low price end of the universe of products available to the consumer. Secondly, economic outlay was manipulated so that the important measure of fiscal commitment was between high- and low-priced alternatives rather than a purchase-or-not-purchase decision. In such a way, the Engel, Kollat, and Blackwell model still served as an expanded conceptualization in which was couched the more restricted focus of the study. Further, the products selected for study are purchased rather frequently in contrast
to a house or a car where several years will usually elapse between acquisitions.

The critical steps in the decision-process model which apply to the adopted risk model include: (1) perception, (2) values and attitudes, (3) evaluation of alternatives, and (4) purchase decisions (see Figure 1).

Perception is discussed above, and values and attitudes were considered only as they related to a respondent's general propensity to undertake risk in a decision. The respondent's general pattern of values and attitudes were expected to be present indirectly in socioeconomic measures considered in the subsequent chapter.

The alternative processes evaluation represented in Figure 1 implied that alternatives are available, that consumers are relatively aware of their presence, and that consumers have some degree of control over which alternative may be chosen. The existence of alternatives, per se, represents risk in that not all possibilities can be readily adopted to solve a recognized need. Such risk is to be differentiated from risks associated with the alternatives themselves, and can be thought of as situational in nature. Indeed, the more alternatives confronting the decision-maker, the higher is the risk of a bad decision, ceteris paribus. A choice among alternatives by its very nature implies that such choices fall on a distribution in terms of payoff and risk. Similarly, the more apparently homologous the
potential courses of action, the higher the perceived risk in making a decision, unless all choices are perceived as identi
cal, in which case situational risk is at a minimum.

The purchase decision, although preceding the outcome process, must necessarily be approached with cognizance of the end results if risks are to be confronted. To have ig
nored potential outcomes would have been contrary to the conceptualization of the study. The theory, simply stated, is that consumer perceptions and thus consumer purchase pro-
cedures are influenced by risks perceived in the possible outcomes of such decisions. Thus, it may be said that the consumer takes into account the uncertainties and conse-
quencies of this decision process concurrently with the unfold-
ing of the decision process.

Further, the acceptance of the decision-process model as the more general theoretical construct demanded that the closed loop aspect, the "storage of consequences," be acknowl-
edged as affecting subsequent decision-making on the part of the consumer (see Figure 1) The feedback dimension is composed of both frequency and affective components. That is to say, both the number of times a given decision has been made in the past and the net results--either positive or negative--affect current decision-making by the consumer when faced with like decisions. Given the assumption that consumers often learn from previous experience, the consideration of experience was important in attempting to understand present
risk perceptions.

In dealing with risks perceived in a given decision, the consumer may adopt one of several options. Three options were identified from the decision-process model. They include: (1) a "halt" decision, which may include postponement of an absolute discontinuation of the decision process, (2) a "yes" decision, which is interpreted as being a continuation of the search procedure and would necessarily include risk reducing techniques, and (3) a "go" decision, aimed at either purposeful decision-making or subversive processes (see Figure 1). In the subversive case, the consumer would suspend action thus allowing for a solution by default, or take a seemingly irrational course as a result of solving cognitive conflict through distortion. An example of such distortion might be the consumer who senses that he must "do something" about his smoking of harsh cigarettes, but concludes that rather than quitting, his problem may be solved by purchasing a "milder" brand. For the most part the present study was limited to consideration of "go" decisions for purposeful problem-solving by avoiding such decisions that might represent alternate dimensions of buyer behavior.

In cases where the consumer perceives little chance of a negative outcome, his strategy may be to ignore such minimal risks and purchase the most convenient product. 19

19 Although it was assumed that many of the risk dimensions associated with tangible products may also affect the purchase and perception of services, the present study focused exclusively on product
On the other hand, the consumer may conclude that the risks associated with the entire universe of known alternatives are considerable, and that the problem to be solved is inconsequential with regard to those risks. Thus, the decision may include leaving the problem unsolved. Similarly, the consumer may feel that risks exist with all options seemingly open to him, and that some options are riskier than others. Furthermore, he may decide to accept the risk associated with the "best" alternative as the "least worst" course of action. In this case a decision is made to accept one of the alternatives without further search or modification of the perceived risks of the alternatives. The risk of the chosen alternative is accepted as tolerable, and little else occurs barring serious negative outcomes.

In other buying situations, the consumer may conclude that risks perceived from among the apparent options are unacceptable. At this point, several courses are possible. First, the entire matter may be dropped, but here, as opposed to the inconsequential problem discussed above, it is assumed that the problem at hand is of some consequence so as to require further attention. Hence, the consumer may forestall a decision pending further search. In doing so, the consumer may seek additional product alternatives that may fall within the bounds of acceptable risk.

considerations. Subsequent observation would be required before the various dimensions of the perceived risks of service purchases can be empirically determined.
Barring the identification of supplemental choices, the consumer is left with the original products. According to the conceptual risk model, the consumer has but three options open to him in giving further consideration to the incumbent product choices. The strategies include: (1) reducing the uncertainty associated with the various products, (2) reducing the consequences of the options, or (3) reducing both the uncertainty and consequences involved.

In attempting to reduce uncertainty of a given product alternative, the consumer may choose to seek more information. Such fact-finding may take the form of discussions with friends or relatives, actively pursuing information from published sources of information, e.g., independent testing facilities reports, governmental agency reports, ad hoc research reports, etc., seeking outside counsel from supposedly neutral experts or trusted merchants, or reading items in the popular press, in advertisements, or materials accompanying actual product alternatives. He could also consult the salesman.

Reliance on previous experience is another means of reducing uncertainty in making a purchase decision. The consumer may purposefully avoid an alternative which has proven to be unacceptable on previous occasions, or purchase a previously used product that has proven acceptable in solving the buying need. Brand names associated with a particular product make identification of past failures and successes easier for the consumer, and buying the same brand
helps to assure the consumer that he will receive the same product performance as previously recorded.

The reliance on past experience may not always be feasible as a primary means of reducing uncertainty. In some cases the consumer may have made a like purchase decision so long ago as to render such experience outmoded. Also, the particular product type may be one that is characterized as undergoing rapid technological change, thus possibly making even recent experience partially inadequate. Finally, the amount of previous experience may have been so little that reliance upon it would provide a poor means of reliably reducing uncertainty.

Another group of uncertainty-reducing methods includes buying only nationally advertised, familiar brands, relying on buying maxims such as "you get what you pay for" or "they're all alike so buy the cheapest," or buying the most expensive brand. The consumer can also vary the place of purchase and the mode of purchase. In doing so, the buyer may regard buying from trusted stores or salespersons as the best means of assuring a positive outcome. Similarly, a consumer may shun telephone and mail-order ordering as being too risky a shopping mode, and prefer to shop only in person. This last observation appeared to provide partial explanation of why so few customers take advantage of a seemingly convenient mode of shopping, the telephone.  

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A hybrid technique that was thought of as both a means of reducing uncertainty and a means of reducing the economic consequences of a negative outcome is purchasing with guarantees. Included in this group of techniques are product warranties, seller guarantees, guarantees assuring return privileges, and free trial sales. Indeed, a number of buyers apparently use charge account privileges as a means of leverage of assuring satisfaction and hopefully reducing the difficulty of returning unsuccessful purchases. Such a strategy is analogous to free trial goods in that no cash outlay is made before trial use is instituted. This strategy holds, however, only when the charge is not handled through an intermediary.\(^\text{21}\)

The second major strategy for confronting unacceptable levels of perceived risk is through a reduction in the consequences of a negative outcome. This group of techniques might include buying the cheapest product available thus minimizing economic risk. Others include purchasing a small-size package, taking advantage of price reductions or rebates or a free sample. In all cases cited above, economic consequences are the major focus. It is also possible that time consequences may be reduced through various strategies invoked by the consumer. Shopping at a retail store rather than by mail order or telephone reduces the time involved

\(^{21}\)Reference is made here to firms which factor their accounts receivable to a second firm at a discount to speed cash flow.
until decision closure occurs. Buying from a local convenience outlet in lieu of making a more distant trip where selections and prices would likely be superior represents an attempt to reduce time consequences involved in the decision. Similarly, pre-shopping in the form of reading advertisements in newspapers or telephone yellow pages, telephoning ahead of a visit, and planning shopping routes may function to increase the buyer's awareness of alternatives to reduce the uncertainty of out-of-stock conditions and wasted trips, and to reduce the costs of traveling to make purchases. Such activities, however, were viewed as more general techniques which were expected to be associated more with consumer types rather than specific product decisions.

The danger or hazards of physical injury from a product decision may also be reduced. The consumer may buy only products that have been government tested, approved by independent testing laboratories, products that have been on the market for long periods thus passing the test of time safety, or products that are less dangerous, per se. For example, a person may decide to purchase a hand-operated lawn mower as opposed to a power mower on the basis that the power driven model would involve excessive physical risks. Some strategies, notably those dealing with repeat behavior, were thought to involve reduction of both uncertainty and consequences simultaneously, and therefore were not classified as single purpose strategies.
Another decision strategy might involve transfer of some or all of the decision-making power to a second party. Here interest is not towards sharing purchase decisions with a spouse or child but rather with a relatively independent second party. Examples of such strategies include reliance on the recommendations of a trusted jeweler, contracting with a real estate broker in purchasing a home, or allowing a pharmacist to suggest a cough preparation. Such an approach appeared most likely to be employed when the purchase has significant economic, physiological, or social consequences attached to a bad decision. Additionally, such tactics might be employed when the consumer is faced with a decision that falls outside his perceived technological or scientific abilities to understand and discriminate among alternatives. Examples for many consumers include rare gems, art work, carpeting, or even heating and air conditioning. As can be seen, such examples are characterized as being relatively expensive and rarely purchased by most people. The high degree of economic risk increases the fiscal consequences of failure, while the intermittent purchase intervals act to diminish the utility of previous information and experience.

If judgmental expertise is sufficiently critical to the choice of an appropriate purchase, society may rule that only select persons be given the prerogative to make such decisions. In such cases, the consumer's ability to make
unilateral purchase decisions is severely restricted unless he belongs to the select group of decision-makers. Examples of restricted purchase behavior include the need to contract with a securities market agent in order to purchase listed corporate stocks, the inability of the average consumer to purchase or possess nuclear fissionable materials, or to deal in dangerous arms. Examples abound in the area of medical care, where the consumer relies on the medical practitioner to make virtually the whole decision concerning his needs.

It should not be assumed that the consumer is entirely without recourse in many second party decision processes. For the most part, the consumer may still decide which product he will eventually accept, if any. He may attempt to influence the second party's recommendations or choices. Finally, the consumer may choose to find another second party if the decision rendered is contrary to the likings of the consumer in the first case.

Most notable for this study was the fact that the average consumer is legally prevented from making preliminary decisions regarding prescription-controlled medications. A designated second person, the licensed physician, retains almost complete control in deciding for the patient.  

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22Lack of bioavailability data for both the prescriber and dispenser may render the primary and secondary decision-makers equally at loss in imparting risk coefficients. Further, the consumer has difficulty establishing risk coefficients on a retrospective basis because he can not control the variables.
Again, the consumer has some discretion as to which physician to accept, where to purchase additional recommended medical treatment, and the mode by which such purchases will be made.

When a second person assumes discretionary authority to make decisions for a client, or when the consumer assigns that right, two things happen. First, the consumer is relieved of some of the complexities of the decision. Second, in the event of a manifest negative consequence, there is someone to share the blame or guilt—or even the legal responsibility. However, the fact that a second party makes the major portion of a decision does not necessarily eliminate the perception of risk on the part of the consumer. Moreover, there is no guarantee that the decision rendered by the second party will be the most attractive in terms of the client's risk perceptions. If the suggested course of action substantially exceeds the client's maximum risk acceptance level, the possibility exists that the client may seek additional counsel or thwart the decision process by failing to fulfill the recommended course of action.

The outcome decision point (see Figure 1) represents what the consumer attempts to evaluate in terms of uncertainties and consequences. When experience is high, the consumer may rely on stored information relating to past consequences. In other words, the consumer who has enjoyed a longer period of making such decisions, i.e., is older; the consumer who has a higher means to shop, i.e., has more money, mobility,
or time; and the consumer with more need in terms of the frequency a decision is required, will tend to have accumulated more opportunities in solving particular buying problems. This attribute does not imply anything concerning the consumer's ability, strategies, or responses to decision-making, only that such decisions are likely to have been made more frequently.

A second dimension of outcome is the response to various past purchasing decisions. A consumer who has experienced a high percentage of positive outcomes from past actions will likely regard additional purchases of a similar nature as less risky than might be expected of an average consumer. On the other hand, the unfortunate buyer who has had the misfortune of many failures in terms of purchases in general, or a specific product in particular, will likely perceive the next purchase with considerable skepticism if not covert fear. Thus, the experiential dimension is further modified by the affectual reaction to past consumer decisions.  

The theoretical risk model rendered above concerned itself exclusively with decision risk but problem risk was recognized implicitly. Namely, that desired beneficial

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outcomes were thought to be related to the situation at hand. Hence, extended consideration of the alternatives and their attendant risks is likely as the problem becomes more serious, unless the severity and immediacy of the problem require prompt if not instantaneous solutions.

In review, perceived risk was seen as being composed of two relatively independent dimensions, uncertainty and consequences. Secondly, risk on a conceptual plane included both the possibility that desired benefits would not occur and that negative consequences would become manifest. It was proposed that risk perception could be examined from the more general decision-process model, and that the principal processes of the general theoretical model include perception, values and attitudes, evaluation of alternatives, and purchase decisions. The possible strategies open to the consumer in resolving or at least reducing perceived risk were seen as many, and strategy selection was thought to be influenced by the consumer’s previous experiences, the situation at hand, and the degree of control the consumer enjoys in making such decisions.

DIMENSIONS OF DRUG DECISION-MAKING

The study was designed to manipulate and observe possible relationships between perceived risk and risk resolution in the context of health decision-making. More specifically, health decision-making was limited to considerations involving drugs. Before specifying the exact intent
and format of the study, however, it is useful to consider the general dimensions of drugs and related decision-making processes.

For purposes of the study, drugs were considered in a most global manner. Drugs were defined to include all chemicals or materials that in some way alter, maintain, improve, support, reestablish, cure, nourish, or affect the human body. Drugs may exert their effects by coming into contact with the body or by transcending the body perimeter. In the latter case, the drug effect results from entry via a natural body orifice or artificial opening. Injections, incisions, and osmosis are examples of artificial openings; whereas, oral, nasal, vaginal, or rectal administration are examples of natural entries. As should be readily apparent, such a definition embraced numerous products typically considered other than drugs. For example, food, toothpaste, alcohol, and tobacco were included in the definition. Similarly, cosmetics, grooming aids, and adjunctive articles such as facial tissues and electric toothbrushes were considered as drugs for purposes of the study.

To reduce the problem of considering such a diverse universe of products, all "drugs" were subsumed under five major categories. Ostensibly, such groups resulted from the decreasing degree of unilateral control possible in consumer decisions concerning the choice, purchase, use, and possession of drugs. In reality, however, the control dimension
was violated in Category 2 below in that loss of decision control results more from lack of knowledge than external pressures on the consumer.

The five categories, in order of decreasing consumer control, included:

Category 1: Drugs having no direct restrictions on consumer decision-making. Included food, cosmetics, grooming aids, adjunct articles, non-alcoholic beverages, and non-prescription drugs typically promoted directly to the consuming public.

Category 2: Drugs with no theoretical decision restrictions, but restriction results through lack of information on the part of some consumers. Included ethical pharmaceuticals, non-prescription drugs normally promoted only to medical practitioners but available without external control.
Examples - Peri-Colace®, Sudafed Syrup®, Ursinus®.

Category 3: Drugs restricted by place of purchase and purchaser characteristics. Drugs of this category are available only through limited outlet types and may require certain standards on the part of the purchaser. Sales restrictions result from legal requirements of age, identification, or need. Alcoholic beverages, tobacco, and some
non-prescription drugs are examples. In the last case, some drugs may only be sold by licensed pharmacists in licensed pharmacies to select customers demonstrating reasonable need and identity. Examples - Elixir of Terpin Hydrate with Codeine, Novahistine DH®, and Robitussin-AC®.

Category 4: Drugs restricted to suasion of the legally sanctioned decision-maker by the consumer. This category included the true prescription-only drugs which require an order from a duly licensed physician and are available only through licensed pharmacies by licensed pharmacists. Examples - Darvon Compound-65®, Librium® and Valium®.

Category 5: Drugs with no legal decisions possible through normal channels of distribution. Illegal and illicit drugs were included in this category as defined by various governmental and quasi-governmental agencies. In addition, those drugs from Categories 3 and 4 obtained by illegal means or possessed and used by unqualified consumers would be deemed illicit. Examples - LSD, morphine, and heroin.

The drug concept was further delimited to exclude all products that are intended primarily for other than human use.
and products used industrially or intended as components for further processing. Thus, the central focus was upon products intended for ultimate use by the consuming public.

In order that respondents considered products which could reasonably be expected to be familiar to them, and to reduce subject participation burdens, drugs from Categories 2 and 3 were eliminated. Further, for a variety of legal and ethical reasons, all consideration of products in Category 5 were excluded. The two remaining groups, however, offered a stark contrast in terms of consumer self-determination. The various elements in Category 1 exemplified those products where the consumer retains virtual control over purchase, use, and possession, save factors of supply and fiscal resources. At the opposite end of the spectrum, Category 4 included those products which are unique in terms of decision-making. In this case, the one who will ultimately use the product, is to be differentiated from the customer, the one who possesses major authority to determine the type, amount, and dose of the drug. The patient must typically initiate the process of obtaining the drug once ordered and must arrange for payment of the purchase. The patient will also benefit from the drug's effects or suffer the overt results of a negative outcome, but the physician has virtual control of the primary decision process. Moreover, it is the physician who considers and refines the problem at hand, and searches and evaluates potential alternatives as the
consumer's agent (see Figure 1).

It should not be assumed that the patient is without recourse in the prescription drug decision. Initially, the patient makes the decision to seek medical attention. The consumer entrusts the physician to make decisions pursuant to his or her best interest. The relationship is further cemented by the fact that the consumer as a part of the larger society lends validation to the physician's decision domain. If for some reason the patient feels dissatisfied with the physician's primary recommendations, recourse is possible. First, the patient may seek another medical opinion. Second, the patient may attempt to modify the physician's choice on a direct basis. Additionally, the patient is free to subvert the decision by several means. He can fail to carry out the decision, i.e., not obtain the ordered medication. The patient may also modify the dosage regimen or the duration of therapy to suit his perceived needs, postpone initiation of therapy, or alter or delete proscriptive therapy involving special auxiliary directions for select drugs. Finally, it is conceivable that the patient might resort to less than legal means of altering the decision by forging a change in a prescription, attempting to persuade the dispenser that another drug was intended or would better solve the problem, or by seeking illicit supply channels.

In the main the study considered that consumer problems of an overt medical nature require purposeful solutions;
that consumers tend to restrict their suasion and activity to legal means; and that they generally accept the physician as the primary decision-maker in matters of prescription drugs.

For purposes of the study respondents were confronted with unique decision-making situations. Respondents were given the task of evaluating alternative hypothetical antibiotic drugs in a manner not unlike that of the physician. It was expected that the degree of perceived risk would be substantial, while the amount of previous experience in making such decisions would be minimal. In such a way, it was hoped that fresh insight might be gained into the perception and preferred solutions of risks under controlled conditions where the subject possessed reduced prior experience.

UTILITY OF RESEARCH

The elements of the two selected drug categories were thought to offer much in terms of understanding consumer behavior. Many of the individual elements of Category 1 are purchased on a relatively frequent basis by many members of society. For instance, the purchase of bread and toothpaste can be expected to occur more frequently for most consumers than would the purchase of an automobile. Such a pattern exists as a result of the size, cost, and expected longevity of an individual unit of product, and possibly for reasons of deterioration and labelled storage requirements.
Further, individual elements of products in Category 1 require a minimal economic outlay relative to other products such as furniture and shelter. This is not to say that specific examples of the first drug group may not approach or exceed the cost of other products in the consumer master list of needs. Surely, it can be argued that a large piece of beef for a big family can not be considered a minor purchase for all people, but relatively speaking, the economic risk involved is typically less than that required to purchase a major piece of furniture or major article of clothing.

Because the relative economic risk of individual elements in Category 1 is low, and the relative frequency of replacement is high, it was expected that the strategies of risk reduction would be well developed. Additionally, the elements of the first group were expected to be relatively free of combined input by husband and wife when the purchase is made for personal use.

For elements of Category 4, prescription-controlled drugs, the consumer exerts little discretionary authority other than persuasive attempts aimed at the primary decision-maker. Previous experience for most consumers, i.e., those who do not qualify as the designated primary decision-maker, is limited to consumption not choosing. For drugs that are taken on a long-term basis, e.g. maintenance therapy, the consumer can be expected to become somewhat familiar with

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his drug regimen. However, acute therapy is by definition specific to the problem currently under study. The consumer's knowledge and previous experience would tend to be less because of the wide spectrum of acute conditions possible and the like variety of possible solutions. By utilizing examples of acute therapies, both the respondent's knowledge and previous experience in making decisions were lessened.

In addition, the lack of experience in making prescription drug decisions on the part of the respondent, and the intermittent nature of acute therapy, were expected to minimize the respondent's knowledge and familiarity with brand names. There was little to be gained by the consumer in consulting reference texts on prescription medications, and word-of-mouth activity would have been relatively dysfunctional in that other consumers suffer from the same information void. Therefore, information which was supplied by the researcher on a controlled basis was expected to be treated on a first time basis.

Finally, the elements of Category 4 chosen for the study, antibiotics, were expected to be reasonably familiar to the respondents on a general basis in that the incidence of antibiotic prescribing is relatively widespread in the population.

Although researchers have included perceived risk in a variety of studies, the results, though promising, have not yielded the expected relationships. Cunningham, however,
has concluded initially that an interest in health matters or physiological safety appears to pervade a wide spectrum of products.\(^{25}\) Moreover, depth interviews have yielded clues that interest in health and safety with respect to drug use is an important and apparently widely distributed concern among consumers.\(^ {26}\) Studies of physician decision-making in matters of new drug adoption, information seeking about drugs, and specific decisions relating to actual drug choice suggest that perceived risk is an important dimension of such activity.\(^{27}\)

For many years advertising messages have given implicit recognition to the notion of risk. Such an observation is especially true for non-prescription drugs which are actively promoted in the mass media. Such claims as, "clinically tested," "no extra ingredients," "we date our vitamins,"


and "doctor approved" seek to assure the listener that such products may be considered as "safe" or at least less risky than alternatives. When dealing with non-prescription drugs, it has been assumed that a better understanding of the nature and type of perceived risks by consumers could materially improve the design of advertising seeking to inform patrons. Alternatively, such findings could also benefit consumers in attempting to understand the techniques of persuasion which they might encounter in the marketplace.

Although the present study was a first step in considering consumer purchase of prescription drug therapy and possible attendant risks, it should be apparent that much of medical therapy is wrought with uncertainties and fears for the patient. Frightening headlines, government press releases about drug effects, and a greater reliance upon chemical solutions to life's problems may all contribute to the patient's concerns. These concerns, if translated into tangible, quantitative measures, could be of potential benefit to the patient. Medical practitioners, both directly and peripherally involved with patient care, could direct their scarce attention to allaying fears of major import to the average patient. Also, such data would benefit the patient through greater understanding on the part of medical

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personnel in attempting to make some sense of why patients act as they sometimes do.

Further, if aspects of prescribed medications are found to be highly disconcerting to a majority of respondents over several studies by various other researchers, drug manufacturers and prescribers could attempt to develop and prescribe alternative drugs which do not possess such characteristics. If major alterations in new drug development or prescribing patterns are found to be impossible, much could still be done by prescriber and dispenser alike to explain and alter the riskiness of drugs as perceived by the patient. Because of their ready access when a prescription is dispensed, pharmacists might find ways of taking a more active role in patient communications. Finally, consumers themselves might learn something about the activity of prescribed drugs, the considerations that confront their physicians, and what to expect from therapy. Such benefits would likely remove some of the mystery of medical care for many consumers.

HYPOTHESES

In order to provide a foundation for the development of the methods and materials of the investigation, and to direct the analysis of the results, specific a priori hypotheses are presented below in the same order as they were addressed in the analysis of the data.
A persuasive intervention, i.e., an indication of the relative benefits to be expected with various antibiotics, produces a significant shift in the preference for various antibiotics.

Preference for the various antibiotics is significantly different when the respondent makes preference choices on behalf of another person.

Preference for individual antibiotics is related to the relative extent of market experience of the antibiotic.

Preference for individual antibiotics is inversely related to the relative price of the antibiotic.

Preference for individual antibiotics is inversely related to the relative severity of the side effect of the antibiotic.

Preference for individual antibiotics is a function of the respondent's general risk taking propensity.

Gender is related to antibiotic preference.

Age is not related to antibiotic preference.

Socioeconomic status is not related to antibiotic preference.

Previous prescription drug use experience is not related to antibiotic preference.

Previous experience with side effects from prescription drugs is related to antibiotic preference.
CHAPTER IV
STUDY METHODS AND DESIGN

A brief overview of the methods and design of the study is provided below to familiarize the reader with the general aspects of the entire investigation. This introduction is expanded subsequently to include a more detailed account of the procedures and materials employed, including prestudy development and explanations of the scaling devices.

METHOD-DESIGN OVERVIEW

The operational phase of the study included the use of four distinct scaling instruments. Each questionnaire was designed to observe specific aspects of the participants' personal characteristics or subjective responses to various risk situations encompassed by the questionnaires. In order to minimize positional bias, multiple forms of each questionnaire were prepared using both left-right and upper-lower rotations. The order of questionnaire administration was also rotated to minimize the effect of respondent fatigue on the study.

One questionnaire sought to identify the subject's general risk propensity. A second consisted of several
demographic questions which had suggested utility in the re-
search literature. The third questionnaire was directed at
respondent feelings, purchase experience, use experience,
purchase decision importance, and specific experience with
four selected health products and several prescription drug
products.

The final questionnaire, involving respondent consid-
eration of twelve, hypothetical antibiotics, was in reality
four different questionnaires. By packaging all the scaling
instruments in unmarked envelopes and distributing the pack-
ets to participants on a random basis, respondents were as-
signed to one of four sub-samples corresponding to one of
the four antibiotic questionnaires.

Respondents assigned to the first sub-sample consti-
tuted the first control group \( C_1 \). In completing the instru-
ment, subjects were asked to consider twelve hypothetical
antibiotics. Each antibiotic was described on a separate
slip of paper. Each description consisted of an indication
of the antibiotic's market experience, average price, and
side effect most likely to occur if the drug was taken.

The task for the subjects was to consider the various
antibiotics as alternatives for personal use. Respondents
were told that a physician at a local teaching hospital had
determined that they had a finger infection which required
an antibiotic. In addition, respondents were told that they
were to indicate their personal preference for each
antibiotic. Preference was recorded through sorting the antibiotics into seven groups along a prefer-not prefer scale.

Another sub-sample was constructed as the first experimental group (E₁). The situation confronting participants in the E₁ group was analogous to that present in the C₁ group. However, the E₁ subject was exposed to additional information prior to his consideration of the antibiotics. This information, consisting of a medical opinion regarding the relative benefits of the various antibiotics, was embodied in an excerpt which ostensibly was taken from a legitimate medical journal. Thus, the participants in the first experimental group were exposed to additional information prior to completing their preference assessment.

Two additional sub-samples were constructed and served as the second control and experimental groups (C₂ and E₂, respectively). Unlike respondents in the first control and experimental groups who made preference assessments on the basis of personal use, the latter participants considered the antibiotics for use by a significant "other" in their personal sphere.

The second control group included respondents who faced decision assignments identical to those made in the first control group, but the intended patient was a young child.

The second experimental group also made decisions
in the same manner as the first experimental group, but again the preference choices were based upon a young child being the intended patient.

Respondents in the four sub-sample groups were allowed to complete the questionnaires at their own pace. To help reduce the potential for systematic error resulting from interviewer effects, restrictions were placed upon interviewer freedom in giving directions and explanations.

The data collection was completed over a five week period. Reassessment of the procedures was undertaken each week in an effort to recognize potential problems which might have produced interviewer and procedure artifact effects on the results. No major problems developed.

Following questionnaire coding, keypunching, and data verification, analysis of the results was undertaken by using a standard statistical package available to the investigator. Analysis was carried out at several levels. Primary analysis consisted of comparing preference differences for specific antibiotics across the various sub-samples. To isolate effects of the three antibiotic characteristics on preference, a second level of analysis was completed within a singular sub-sample \( (C_1) \). Finally, the various background respondent characteristics were utilized as control variables.

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in an effort to further understand the observed preferences for the individual antibiotics.

DEVELOPMENTAL TESTING

Although the demographic questionnaire and the general risk propensity questionnaires had been used by other investigators, the remaining questionnaires were unique to this study. Further, no previous researcher had used the standard questionnaires in the context of the present design.

To achieve an indication of potential respondent difficulties in completing the various questionnaires, several pilot tests were instituted prior to the full-scale study. In all, four different pretests were conducted involving respondents not included in the final study. Successive rewording of questionnaire instructions and modifications of the various formats resulted in an elimination of several administration problems.

Prior to the actual study, and following approval by a human subjects review committee within the university, a final pretest was conducted. The final pilot test resulted in the following conclusions:

(1) Participants could complete the entire battery of questionnaires in from twenty to forty minutes.

(2) Respondent debriefing ranged from none to ten minutes, depending upon respondent interest.

(3) Some respondents preferred not to answer some
demographic questions considered too personal. This observation was highly concentrated in the income question.

(4) Respondents appeared to understand the directions for each questionnaire and completed the tasks with minimum difficulty.

(5) No major problems surfaced which might have jeopardized the actual study.

(6) Interviewers possessed adequate skills to complete their participation.

SCALING METHODS

To protect the interests of both subjects and the investigator, a standard consent form was included with the battery of questionnaires. The questionnaires numbered four, ignoring the various rotated formats. The four questionnaires were:

1. General Information Questionnaire (GIQ)
2. Preference—Experience Questionnaire (PEQ)
3. Choice Dilemmas Questionnaire (CDQ)
4. Antibiotic Preference (AP)

An expanded description of each instrument, together with the rationale for use and the individual coding procedure, is presented below. 

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2 Although not critical to the study results, the consent form is reproduced in Appendix A.

3 One rotational form of each questionnaire is reproduced in the individual technical appendices identified in the subsequent text.
General Information Questionnaire

Several demographic characteristics were incorporated in a single questionnaire, known as the General Information Questionnaire (see Appendix B). Such information can be gathered rapidly, and, in fact, the GIQ was completed by most respondents in less than two minutes. In addition, the perceived risk literature provided evidence that several respondent characteristics appear to exert an indirect influence on risk perception and preferred risk resolution.

The attributes most frequently cited as explaining observed variances of risk perception include age, gender, and social status. Supplemental demographic measures have been used in various studies, but with generally negative results. Cunningham suggested that demographic attributes have yielded little if any utility in attempting to understand risk perception. However, the relative ease of collection coupled with a potential value, as cited in the studies above, argued for the inclusion of a select few in the study. In addition, participant characteristics provided a means of assessing the overall dimensions of the sample.

For purposes of the study, the demographic measures


were incorporated in a single questionnaire (GIQ). To pro-
vide a measure of socioeconomic class, the study adopted
the method developed by Green. The traditional Index of
Status Position (ISP) developed by Hollingshead was consid-
ered, but was discarded in view of the apparent weaknesses
in the two-factor ISP. The Green method was specifically
designed to "optimize the prediction of family health actions
from socioeconomic data," thus making it especially applicable for the present study.

The Green measure is composed of three factors with
allowances made for regional differences in place of resi-
dence. The major differences between the Green measure and
the one developed by Hollingshead are the substitution of the
education of the female head of the household in place of the
male's education, and a one standard deviation shift upward
of occupations within the health care delivery system. The
three factors included in the Green measure are: (1) educa-
tion, (2) occupation, and (3) income. Specifically, educa-
tion is recorded as the education of the female head of the
household, or the male head if no female exists. Income
is recorded as the gross, pretax, family income. Occupation
is recorded as the present or normal job of the primary wage
earner, or the employee with the better paying occupation.

7For an expanded discussion of the failings of the ISP, the
reader is directed to Green, p. 815.
8Ibid.
Unemployed persons are placed into the occupational class in which they normally work, while college students are assigned to the occupation based upon their educational major. Occupations which cannot be located in the master list of scores are assigned to the major category which most closely describes the job.

Large scale studies throughout the entire country in a variety of settings have indicated that the index has general application. Further, the index allows for missing data or the estimation of missing data from explanatory tables. The theoretical range of the scale is from zero to ninety-nine, but the various scoring methods limit the effective range to thirty to eighty-five. Although three distinct scoring methods are possible, the results of each method are comparable. Hence, the choice of the scoring formula is typically based upon which inputs are readily available.

Maximum prediction of preventive health behavior can be achieved in the general population (multiple $r = 0.500$ vs. multiple $r = 0.438$ for the ISP) when the three factors are combined by the following formula: $SES = 0.5 \times \text{education score} + 0.3 \times \text{occupation score} + 0.3 \times \text{income score}$. Although the three factor scoring method above was adopted for the study, it was initially planned that an

\[ \text{Ibid, pp. 817-18.} \quad \text{Ibid, pp. 816-25.} \quad \text{Ibid, p. 825.} \quad \text{Ibid, pp. 825-26.} \]
additional scoring method, supposedly sensitive to ethnic origin, would also be included. Such plans were scrapped when non-whites repeatedly declined to participate or even consider participation.  

Besides the ordinal value resulting from the socioeconomic measures, the GIQ included two additional respondent characteristics. In order to suggest variances of risk perception, age and gender were included as nominal control variables. In the subsequent evaluations of the study's results, therefore the three demographic attributes, viz., age, gender, and socioeconomic status, were utilized as control measures.

Selected Products for Testing

In order to achieve the objective of the Preference Experience Questionnaire it was necessary to include several health products for comparison against prescription drugs in general, and antibiotics in particular. The five products specifically chosen for the PEQ included: (1) underarm deodorant, (2) bread, (3) headache remedy, (4) facial tissue, and, of course, (5) an antibiotic. Each product was chosen for its particular characteristics and general use in the population.

Cunningham concluded that a health danger seems to be

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13No explanation of this phenomenon was identified. One may only speculate that non-white persons may have felt threatened by the amount of participation required. Such a conclusion resulted from several informal discussions with non-white declinees.
perceived by consumers over a wide range of products.\textsuperscript{14} The most important criterion in making the individual product choices was the product's health involvement. Of the products chosen, four fall into the drug class of products for which the consumer retains virtual control over decision-making.\textsuperscript{15} Facial tissues and underarm deodorant are both products used externally on the surface of the body. Facial tissues may be described as grooming adjuncts; whereas, underarm deodorant is more truly a cosmetic product but which exerts drug effects on the body as defined earlier.\textsuperscript{16} In addition, underarm deodorant may possess substantial social meaning in the mind of the consumer.

Bread and the headache remedy share the common characteristic of being used internally. Bread is typically thought of as a food, but is included as a drug by virtue of its effect as a nutrient to maintain the body.\textsuperscript{17} Headache remedies act to eliminate or reduce pain, and are most obviously a drug under the study's conceptual framework.\textsuperscript{18} To the consumer it is likely that bread would not be perceived as a drug, but Cunningham's observation concerning the widespread interest in potential health dangers across products unlikely to be considered drugs made bread a reasonable choice.

A priori, it was expected that the perceived risk

\begin{itemize}
\item \textsuperscript{14} Supra, p. 78.
\item \textsuperscript{15} Supra, p. 79.
\item \textsuperscript{16} Supra, p. 78.
\item \textsuperscript{17} Supra, p. 78.
\item \textsuperscript{18} Supra, p. 78.
\end{itemize}
associated with each product would vary by product and by respondent. On the whole, it was thought that the four products would be arrayed, from high to low risk, in the following manner: (1) underarm deodorant, (2) headache remedy, (3) bread, and (4) facial tissue. It was thought that, although analgesics are more readily viewed as drugs, the social risk component of underarm deodorant would add to its overall risk rating. Hence, the expectation that underarm deodorant would be perceived as the most risky product.

The final product used to implement the PEQ was the general term antibiotic. The choice rested upon the central interest in antibiotics in the experimental phase of the study. In addition, the relative position of antibiotics in relation to the other four products along a perceived risk continuum was desired to validate the assumption of prescription drugs as high perceived risk products.

Antibiotics are included in the fourth drug category adopted for the investigation. Such a classification rested upon the observation that the typical consumer is effectively limited to whatever persuasion he can muster over the prescriber in affecting the primary decision-making of drug therapy.

All five products were also chosen on the basis that they are likely to be purchased by a high percentage of the

\[^{19}\text{Supra, p. 80.}\]
general adult population. If all respondents did not purchase all five products as a regular part of their consumption patterns, it was only required that virtually all respondents recognized the products.\textsuperscript{20} Finally, the five drug products were chosen on the basis of their inclusion in the overall drug paradigm adopted for the study.\textsuperscript{21}

A priori, it was expected that antibiotics would be perceived as high risk products, especially at the upper end of the risk continuum represented by the four other products.\textsuperscript{22}

\textbf{Preference-Experience Questionnaire}

Previous investigators have observed that the importance attached to a product under consideration for purchase may act as an important intervening variable in the assessment of the product decision.\textsuperscript{23} Further, interest in the product, as recorded from sample respondents, may influence how that product will be perceived. Whereas, experience with a given product may increase the consumer’s knowledge of the

\textsuperscript{20} Supra, p. 80.

\textsuperscript{21} Pretests and the actual study results indicated that all products met the critical requirements.

\textsuperscript{22} The adopted drugs for the study do not exhaust the possible dimensions of such choices. For instance, the use of long-term therapy prescription drugs or drugs whose mode of action is relatively obscure might produce results different than those recorded. Services, as opposed to tangible products, pose an entirely unexplored area which might be applied to the same research framework.

\textsuperscript{23} Higbee and Lafferty, "Relationships," pp. 249-51.
product, and possibly decrease the uncertainty associated with the product, experience of use is not necessarily synonymous with experience of purchase. It was assumed that some purchase decisions are made with the purchaser acting as a surrogate for the ultimate consumer. It was also assumed that some purchasers have substantial experience, but that experience would represent purchase not use. The buying agent may or may not impart personal decision-making to the purchase, depending upon whether the purchaser was acting as the actual decision-maker, e.g., a gift for a friend, or simply as a conduit for the ultimate consumer, e.g., buying cigarettes for a spouse. Thus, measures of product purchase experience and use experience were thought to be distinct concepts, which, if observed independently, would be expected to enhance the explanation of perceived product risks.

Experience in using an entire class of products, e.g., alcoholic beverages, may exert diverse effects upon the perception of individual elements of that class. Such effects were thought to be possible irrespective of whether the consumer has experienced the individual element or not. Therefore, consumption patterns of an entire class of related goods were expected to manifest utility in understanding perceptions of individual elements of that class.

The general conceptual model adopted for the study provides the consequence feedback (see Figure 1, p. 63). The cybernetic loop was conceived as encompassing affectual
feedback of product use. In the most simple case, affective consequences may be positive or negative. By representing negative and positive feedback as "-" and "+,” it became possible to describe eight polar experience conditions of a consumer (see Figure 2).

<table>
<thead>
<tr>
<th>Affective Reaction</th>
<th>Purchase Experience</th>
<th>Consumption Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>(+)</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>(-)</td>
<td></td>
<td></td>
</tr>
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<td></td>
<td>High</td>
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<tr>
<td></td>
<td>A</td>
<td>B</td>
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<tr>
<td></td>
<td>C</td>
<td>D</td>
</tr>
</tbody>
</table>

Figure 2 Eight Polar Experience Conditions

As may be discerned in an examination of Figure 2, several conditions have received little notice in the literature identified in Chapter II. Most notable are cells B and D, where the purchase experience is high but use experience low. Similarly, cells E and G represent a condition where purchase experience is low and use experience high. All four of the consumer states represented by cells B,D,E and G were expected to represent minority conditions in the sample participants.

Although consumers within the individual cells were expected to produce unique patterns of risk perceptions, there was little basis on which to predict outcomes with any
degree of confidence. The published literature yielded little indication of possible effects, direction of effect, or interactions. Specific hypotheses, concerning the relationships of the cells to perceptions for the five selected products, were generally omitted. At an intuitive level, however, it was expected that the affective dimension, either negative or positive feelings about previous use, would: (1) produce a relationship with antibiotic preference, and (2) produce the strongest effect of the three dimensions represented in Figure 2.

In order to assess the foregoing respondent attributes, a five question instrument called the Preference-Experience Questionnaire was developed. It incorporated the five products chosen for the study and the respondent attributes discussed above (see Appendix C).

Question one, utilized paired-comparisons to record interest in the various products. Such a means of data collection provided for direct comparisons, placed the products close together in time, forced respondents to make overt choices, and aided in eliminating response fatigue. Because participant involvement was substantial when all questionnaires were considered, the rapid completion time for paired-comparisons was important. Further, Miller contended that

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the technique provides an adequate means of generating a relative ordering of many elements, and that paired-comparisons typically yield excellent results in terms of reliability and validity. 26 Since relative ordering was all that was necessary, more discriminating methods were discarded. 27

The importance of the purchase decision for the five products was embodied in question two of the PEQ. In this case, a finer discrimination level was desired. Therefore, a seven-point scale was used in asking respondents to indicate their subjective assessment of purchase importance. Response options ranged from "very important" to "very unimportant," and scoring was based upon the numbers associated with the various points on the continuum, i.e., "very important" scored as 7, next most important as 6, and so on.

Questions three and four of the PEQ represented the operational measures of product purchase and use experience, respectively. Because of recall difficulties observed in the initial development of the questions, the time frame was limited to one year. Coding was accomplished by assigning each frequency category a number, e.g., more than once daily as a 1, daily as a 2, and so on. The last two rates were both

26 Ibid.

scored as a 9.

Because the intent of the third and fourth questions was to classify respondents into gross categories of either high or low experience rates, the question design was considered adequate. In addition, respondents were able to complete the two questions rapidly.

The central interest in antibiotics provided the basis for the last question in the PEQ. As previously mentioned, the use and affectual response to other elements within a given class of products may affect the perception of individual product elements of the class. Therefore, the last question of the PEQ represented the interest in the general class, prescription drugs, and the more specific elements, antibiotics and penicillin. In addition, the last column allowed for a relative ordering of subjects on the basis of their having experienced side effects to prescription drugs.

Each term employed in the final question was chosen for its high comprehension rate in the various pretests. For instance, drugs such as digoxin, propanolol, or propoxyphene napsalate would have had minimal recognition rates as evidenced by the developmental work. The design of the question required that subjects could recognize and respond to the particular drugs or drug classes included. When the general term, "heart drug," was adopted for digoxin, recognition rates climbed dramatically.

The respondent was required to make a choice for each
drug on the basis of "have taken," "have not taken," or "cannot recall taking," as well as indicate whether he had experienced side effects to the drug. Blanks alerted the interviewer that the respondent had either skipped the line or had decided to forego answering the line question. In either case, a means existed for assessing the extent of non-response.  

The last column of question five, experience with side effects, would have required extreme effort on the part of the respondent if accuracy would have been critical. However, the intent was to record the extent of side effects perceived to be side effects by respondents. This objective derived from Bauer's original thinking, in that risk requires perception before it affects behavior.  

Six measures were extracted from the PEQ. These included:

(1) Overall prescription drug experience; none to four different drugs scored as 1, over four scored as 2.

(2) Antibiotic experience; had taken scored as 2, had not taken scored as 1.

(3) Penicillin experience; had taken scored as 2, had not taken scored as 1.

(4) Side effect experience; have had a reaction to any drug on page scored as 2, no reactions scored as 1.

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28 This problem did not occur at all in the actual study.

(5) Antibiotic side effect experience; yes to either term "antibiotic" or "penicillin" scored as 2, no to both scored as 1.

(6) Penicillin side effect; yes scored as 2, no scored as 1.

The resulting nominal data were far less than that produced by the fifth question, but the inability to generate a sample of sufficient size to enable analysis of each individual drug precluded using more variables. However, the inclusion of seemingly superfluous drugs was deemed necessary to protect the intent of the question.

It was recognized that question five represented a gross attempt to assess the extent of prescription drug experience and drug reactions. However, the incidence of an observable drug reaction is often a dramatic event, and was expected to produce effects upon antibiotic preferences, if such a relationship exists, even with such a crude measurement level.

**Choice Dilemmas Questionnaire**

The published literature of risk perception provided evidence for the use of a measure designed to observe general risk-taking propensities. Development of such a scale resulted from work completed by Kogan and Wallach.\(^{30}\) The scale, known as the Choice Dilemmas Questionnaire (see Appendix D),

has been used to investigate differences in group and individual decision-making.\textsuperscript{31} Other research efforts have included the CDQ, but have expanded the scope of study to include the mediating effects of the judged consequences of failure in a decision,\textsuperscript{32} the changes wrought when the respondent decided for himself as opposed to an "other,"\textsuperscript{33} and the effects of the decision importance and control on risk preferences and decision results.\textsuperscript{34} Finally, the original CDQ has been modified to increase its utility across social strata by altering the vocabulary and the situations considered.\textsuperscript{35}

The original Kogan and Wallach method was based upon subject decision-making under the aegis of advising the central character of each dilemma presented. Results represented the actual respondent's willingness to undertake various risks. In its original form the CDQ consisted of twelve dilemmas, each describing a different choice faced by the individual central character.\textsuperscript{36} In each dilemma the protagonist faced a relatively "safe" course of action with a low payoff, and a riskier option with a high payoff. It was explained to


\textsuperscript{32}Clark and Willems, "Risk Preferences," pp. 827-30.

\textsuperscript{33}Zaleska and Kogan, "Level of Risk Selected," pp. 198-213.

\textsuperscript{34}Higbee and Lafferty, "Relationships," pp. 249-51.

the respondent that in each case the central figure preferred
the more risky alternative. In addition, the respondent was
told that the central character had asked the respondent for
advice concerning the courses of action. Finally, the respon­
dent was directed to indicate the minimum chance for success
he would demand before recommending that the advisee take
the riskier course of action. Chances of success were in
terms of 1, 3, 5, 7, 9 chances in 10 with the final option
being specified as non-concurrence under any circumstances.

Underlying the use of the scale was the assumption
that the respondent would project his personal risk propen­
sities reliably into the dilemma, and the results would
therefore mirror the respondent's risk style. 37

Since the development of the original method, the num­
ber of dilemmas has been reduced from twelve to six with no
apparent loss of reliability. 38 Fleming modified the CDQ
slightly to allow for better comprehension over a wider range
of socioeconomic status and educational abilities. 39 The
procedures introduced by Fleming consisted of selected modi­
fications to reflect words more universally understood and
changes in the job descriptions in several dilemmas to facil­
itate enhanced respondent recognition (see Appendix D for
the shorter, modified form of the CDQ which was used for the

37 Wallach, Kogan and Bem, "Group Influences," pp. 75-86.
In making the changes Fleming hypothesized that risk-taking propensities would be expected to vary not only across subjects but also across socioeconomic class.\textsuperscript{40} In comparing the risk acceptance among literate welfare recipients against college students, Fleming found that "a person's social position in society may greatly influence his interpretation of the desirability of alternatives."\textsuperscript{41} Secondly, Fleming concluded that "a person's position in society may greatly affect his perception of the uncertainties of actually attaining the desirable outcome."\textsuperscript{42} However, Fleming noted that in cases where the respondent, or the protagonist in the dilemma, would not shoulder the blame for failure, the risk acceptance of both groups was identical (see items 2 and 5 in Appendix D).\textsuperscript{43}

The interpretation of the CDQ results is quite straightforward; risk acceptance is less as the chances of success required increase. Scoring was based upon the subjects' "chance of success" indication for each dilemma. For instance, a response indicating concurrence at "1 chance in 10" was scored as one, "3 chances in 10" as three, and so on. The total rejection alternative was scored as eleven. The scores

\textsuperscript{40} Fleming, "Social Position," pp. 67-68. \textsuperscript{41} Ibid, p. 74.
\textsuperscript{42} Ibid.
were then summed and averaged.\textsuperscript{44} Hence, the higher the CDQ score, the less willing the respondent is to accept a high level of risk.\textsuperscript{45}

In studying the CDQ over a sustained period, Kogan and Wallach applied the method in a variety of settings with a variety of respondent types. Spearman-Brown reliability coefficients using split halves have resulted in coefficients ranging from 0.53 to 0.80, "suggesting that the instrument possesses satisfactory internal consistency."\textsuperscript{46}

In noting that responses reflecting conservatism appear to increase with the increasing age, regardless of sex, the researchers concluded that the construct validity of the CDQ as a risk-taking measure appears "consistent with a risk-taking interpretation."\textsuperscript{47}

**Antibiotic Preference**

The final scaling instrument was named the Antibiotic Preference, and was actually a series of four different questionnaires (see Appendices E, F, G, and H for one rotational form of each of the types). The evolution of the AP methodology may be traced to several sources.

\textsuperscript{44}Although the median may be a more appropriate measure in light of the scale level, the study adopted the measure recommended by Kogan and Wallach.


\textsuperscript{46}Wallach, Kogan and Bem, "Group Influences," p. 78. \textsuperscript{47}Ibid.
The first source of the Antibiotic Preference instrument resulted from a discussion by Brody and Cunningham, in which the authors attempted to provide a conceptual framework for observing the effects of personality on consumer decision-processes.\textsuperscript{48} It was hypothesized that risk-reducing variables would be most likely employed by consumers if certain conditions were present. Such conditions include:

(1) Perceived performance risk high, while specific self-confidence on the part of the consumer is low.

(2) Perceived performance risk high, while specific self-confidence on the part of the consumer is low \textit{and} the perceived social risk of the decision is high.

(3) Perceived performance risk low, while specific self-confidence on the part of the consumer is low \textit{and} the perceived social risk of the decision is high.\textsuperscript{49}

In each of the above cases, Brody and Cunningham expected consumers to invoke risk-reducing tactics in arriving at a purchase decision. Therefore, it was concluded that a study of risk resolution was of interest and that products fulfilling one of the three conditions would provide an excellent starting point.

The hypothesis tendered by Brody and Cunningham placed strong emphasis on the importance of specific self-confidence, or the feeling on the part of the consumer that he possesses

\textsuperscript{48}Brody and Cunningham, "Personality Variables," pp. 50-57.

\textsuperscript{49}\textit{Ibid}, p. 52.
adequate skills and knowledge to differentiate among various alternatives in the decision choice. Whenever the perceived product performance risk or perceived social risk is high, consumers can be expected to employ risk reduction tactics. But such activity is likely to reach its zenith when the critical element, specific self-confidence, is low.

The concept of risk perception has appeared in several studies dealing with physician decision-making. The conclusions often have indicated that physicians do perceive risk in making such decisions. Therefore, a reasonable hypothesis was formulated: if the trained professional perceives risk, the untrained consumer can be expected to perceive even higher levels of risk. In addition, the untrained layman would be likely to possess minimal knowledge about prescription drugs, and hence exhibit an unusually low level of specific self-confidence.

Another study produced tentative confirmation of the initial hypothesis in a somewhat indirect manner. In a study of non-prescription drugs, Engel, Knapp, and Knapp argued that there are strong signs that the "absence of specific knowledge about a drug or treatment procedure leads to a significant degree of perceived risk."  


In a related study by the same investigators, involving extensive depth interviews with consumers, it was stated that "if a product had not been extensively advertised or was not a popular brand, its usage was viewed as very risky." Such an observation was taken as an additional confirmation that drugs represent an area of extremely low specific self-confidence for the typical consumer.

It was concluded that a study involving prescription drugs would include products with a substantial degree of perceived performance risk. Not only are prescription drugs not advertised to the general public, but many of the names are relatively obscure to even medical personnel. Hence, the specific self-confidence on the part of the consumer would likely be minimal. Finally, consumers in general are not charged with the responsibility of making prescription drug decisions, hence a study of prescription drugs would likely render the respondents free of previous decision experience in the majority of cases.

The decision was made therefore to examine risk perception and resolution using prescription drugs. Not only would respondents be virtually free of previous decision experience, but they would be likely to perceive high levels of performance risk and have relatively low levels of specific self-confidence in differentiating alternatives within

a decision matrix.

To limit the product dimensions to a manageable size, three prescription drug attributes were identified which were thought to be important to the typical consumer. The dimensions included: (1) the price of the drug, either high or low, (2) the type of side effect to be expected from using the medicine, and (3) the extent of the drug's market experience.

The price of the drugs was set at either $2.95 or $8.85. The notion of "expensive" was considered irrelevant since the importance dimension was preference for a $2.95 drug versus an $8.85 drug. Neither price appeared to exceed what the pretest respondents considered unrealistic for a typical prescription, and the two prices were definitely perceived as being different. Price represented a consequence devoid of uncertainty. If the respondent chose the $2.95 drug, the price would be $2.95 with almost virtual certainty.

There was evidence that consumers tend to take more note of negative events rather than positive events in their purchasing of various products. In other words, consumers expect products to perform, and remember the negative consequences of a purchase more readily than positive outcomes. Knapp, Knapp, and Engel observed that when respondents had noted negative reports on a drug in published reports, the use of the particular non-prescription drug was strongly retarded.53

53Ibid.
In light of such findings, a side effect dimension was added to the prescription drugs. The respondent could expect to either endure a stomach ulcer or a skin rash in choosing particular drugs. Although the problem was not relevant, no information was known as to how much more severe respondents considered ulcers than a rash. It was known, however, that pretest subjects universally indicated that they would rather have the skin rash because of the perceived severity of a stomach ulcer.

The side effect represented both a consequence and an uncertainty in that respondents did not have any indication of the probabilities of occurrence. However, the uncertainty involved was standardized to some degree by making the side effect descriptions identical: "may cause stomach ulcers" and "may cause skin rash."

Initially, it was planned that the drugs would vary on whether or not they required a prescription. The drugs were described in terms of requiring or not requiring a prescription. In all, initial plans called for three drug attributes each having two values. Allowing for all possible combinations, eight different drug descriptions were required, i.e., $2 \times 2 \times 2$.

The first pretest of the drugs, which included simply asking respondents to describe their feelings about the eight "antibiotics," proved the fallibility of reasoned judgment. Over ninety percent ($N=21$) of the pilot participants quickly
recognized the alternatives as hypothetical. From discussions with respondents it became apparent that the respondents rejected the idea of non-prescription antibiotics as pure bunk. They failed to believe that their physician or any physician would even consider prescribing a drug which did not require a prescription. The respondents apparently regarded the whole idea as being absurd. Moreover, it appeared that respondent experience with non-prescription drugs would likely confound any formal observations.

In response to the dismal results, the prescription - non-prescription dichotomy was eliminated. Observations that consumers do not necessarily equate novelty and attractiveness as synonymous constructs, led to the adoption of market experience as a reasonable attribute for the antibiotics. In response, three different degrees of market experience were developed. The antibiotics were described as being: (1) "released ten years ago by the Food and Drug Administration for general use," (2) "released recently by the Food and Drug Administration for general use," and (3) "released recently by the Food and Drug Administration for experimental use."

In addition, irrelevant alphanumeric identification numbers

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54 Actually, it is not uncommon for physicians to prescribe non-prescription drugs for their patients. The fact that a drug does not require a prescription does not preclude the drug from being effective.

were added to the various antibiotics in an effort to improve the face validity of the choices. In a second pretest, the changes resulted in complete acceptance by all subjects that the descriptions were actual drugs (see Figure 3 for summary of antibiotics).

In the final study, twelve antibiotic descriptions, as outlined in Figure 3, were used.

<table>
<thead>
<tr>
<th>Side Effect</th>
<th>High</th>
<th>Low</th>
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<td>Severity</td>
<td></td>
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</table>

<table>
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<th>High</th>
<th>Low</th>
<th>High</th>
<th>Low</th>
<th>High</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Old Drug</td>
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<td></td>
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<tr>
<td>New Drug</td>
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<tr>
<td>Experimental Drug</td>
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<tr>
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<td>KP2935</td>
<td>LK2307</td>
<td>LN3722</td>
<td>LP4321</td>
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<td>NL3855</td>
<td>LM3407</td>
<td>ML5321</td>
<td></td>
</tr>
</tbody>
</table>

Figure 3 Summary of Antibiotics

Each description included one state of each of the three dimensions, and all possible combinations were included, i.e., 2 x 2 x 3. A typical description appeared as:

ANTIBIOTIC-#LM3407; released recently by the U.S. Food and Drug Administration for experimental use; average price is $8.85; may cause skin rash.

Before modifications required by the results of the first antibiotic pretest, some consideration was given to the use of paired-comparisons, but the eight initial antibiotics would have generated twenty-eight pairs for consideration.
The final use of twelve different antibiotics would have meant sixty-six comparisons, which appeared excessive for respondents.

Eventually, a method utilized by Cox and Rich was adopted as a superior alternative to paired-comparisons. In studying consumer perceptions of telephone shopping across a variety of products, Cox and Rich employed a method known as the Q-sort, which has several advantages over the paired-comparison method. First, the Q-sort method allows the respondent to rapidly handle more than two alternatives simultaneously. Secondly, it constitutes both a measure of relative position and the strength of that position. In addition, the Q-methodology allows the use of smaller samples than are typically required for observing multiple factors. Instead of giving a large number of people few tasks, the methodology allows for giving fewer respondents more tasks. Finally, extensive work by Stephenson indicated that Q-sort results form interval measures amenable to parametric analysis if so desired.

Each respondent completed the Antibiotic Preference instrument. The participants were confronted with twelve antibiotics slips each of which described one of the antibiotics in terms of the three factors included in the


57 Ibid and Stephenson, The Study of Behavior.
study. It was explained that, because of special conditions, the physician who had diagnosed the finger infection described in the directions would allow the respondents to indicate their preferences. Seven preference levels were described as:

<table>
<thead>
<tr>
<th>Rank</th>
<th>Letter</th>
<th>Preference</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>A</td>
<td>Most</td>
</tr>
<tr>
<td>2</td>
<td>B</td>
<td>Preferred</td>
</tr>
<tr>
<td>3</td>
<td>C</td>
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<td>4</td>
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<tr>
<td>5</td>
<td>E</td>
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<tr>
<td>6</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>G</td>
<td>Least</td>
</tr>
</tbody>
</table>

In making the preference choices, respondents were required to sort the antibiotics into seven piles or groups corresponding to the preference levels. No mention was made concerning how many antibiotics could be placed in a given preference pile except that at least one antibiotic had to be assigned to each of the seven piles. Because of the number of drugs and the number of preference levels, it was impossible for respondents to assign equal numbers of antibiotics to each of the seven groups. In such a manner, the respondents were forced to make decisions using all three antibiotic attributes.

Once respondents had completed the sorting procedure, the corresponding preference pile letter was written on the face of each antibiotic slip. Scoring was accomplished by assigning numbers to the various preference groups, e.g., "A" was scored as seven, "B" as six, and so on. The scoring method resulted in the highest scored number representing the most preferred drug.

The fact that the twelve antibiotic slips were
shuffled before being attached to the directions page, meant that the order of presentation was randomized over all respondents. Test-retest reliability was high in an initial pretest, but the small sample size precluded a statistical assessment of reliability. In addition, there appeared to be no means of implementing an external validity criterion. The various legal and ethical implications of allowing subjects to actually make such choices appeared insurmountable. However, respondent preference was operationally defined as the answers given by respondents. Thus analysis focused on the differences in preference for individual antibiotics across the various control and experimental variables. Finally, subsequent comments furnished by respondents following participation indicated that the task was taken quite seriously.

The problem of a validity measure was considered in light of Hansen's argument that in order "to obtain measures that relate to the choice in a known way, it is necessary to manipulate the choice."\textsuperscript{58} Investigators have often turned to simulation as a means of gaining manipulative control over complex relationships. In a well-designed study to assess the comparative usefulness of several marketing research methods, it was found that simulation produced better results in terms

of reliability and validity than did such seemingly more venerable methods as home inventory and last purchase verification. "Better" in this sense was defined as the ability to predict more accurately subsequent behavior.59

The AP scale was constituted as a behavioral simulation. In fact, the findings regarding the overall predictive validity of behavioral simulations resulted from an almost identical design. In the study cited, consumers were asked to make simulated shopping trips to decide upon their preferences for various alternative products.60 In the end, the Antibiotic Preference construct was viewed as a unique means and opportunity to observe risk perception and resolution under controlled conditions even in the absence of external validation.

STUDY DESIGN

In presenting the components of the overall operational design, attention is drawn to three separate but related areas. Initially, discussion focuses on the sampling frame, including the sampling unit, sampling plan, and respondent characteristics. This section is followed by an explanation of the actual experimental treatment and procedures

59 Ibid.

which encompassed the actual directions and explanations given to participants. Finally, a general framework of analysis is developed in order to provide a basis for interpreting the survey results. The analytic overview includes discussion of the data characteristics, relevant statistical methods, and the relationships for examination.

**Sampling Frame**

The sampling unit for the study was the individual as opposed to the family. An individual was defined as a singular person, of age twenty or more, who was generally involved in the purchase and consumption of health goods.

Although risk perception has been reported in industrial buying environments, the products adopted for the survey were such that observation appeared to be more fruitful at the final consumer level.

Consideration was also given to using retailers as the sampling unit on the basis that they offered a better opportunity for respondent control and cooperation. The retailer is in frequent contact with the consumer by virtue of the nature of his business. Both frequency of contact and spatial proximity with the consumer appear to be higher for the retailer as compared with the manufacturer or wholesaler. The number of retailers, in this case pharmacies, is far less.

than the number of consumers. Such a characteristic indicated that a larger percentage sample would have likely been possible, allowing for better control and easier identification of the sampling unit.

The retailer, as the likely sampling unit, was discarded in light of research which appeared to indicate that retailers suffer major perceptual distortions when asked to describe the attitudes and buying motivations of retail patrons. Moreover, the increasing popularity of self-service retailing seemed to indicate that direct contact between the retailer and the consumer would be further eroded.

A search of the literature also suggested that the family might have been an appropriate sampling unit. The products selected for study, however, were such that their purchase was seen as being considered and consummated at the individual consumer level.

In addition, the identification of husband-wife pairs was virtually impossible because of the method of assigning participants to the various sub-samples. Given such data,

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64 Oslund, "Role of Product Perceptions," p. 262.
it might have been possible to determine any interaction of purchase perception and corresponding behavior. Finally, stipulations imposed by Human Subjects Program Guidelines at The Ohio State University were such as to prevent identification of respondents which might have allowed for such analysis.

In adopting the individual consumer as the sampling unit, it was felt that the products under consideration should be placed closest in time to the eventual purchase and use of such products. Moreover, the individual consumer appeared more likely to vary on the attributes of interest.

Although the development of a probability sample would have allowed for mathematical assessment of the magnitude of the sampling error, the physical and fiscal requirements of such a sample exceeded the resources available to the investigator. Instead, a judgment sample, which would come closest to a probability sample, was used as an alternative. In an effort to minimize the sampling error of the judgment sample, questionnaire formats, administration sequences, and placement of respondents into the four sub-samples were randomized.

The inherent limitations of a judgment sample precluded generalizing the results beyond the actual sample.

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66 Ibid, pp. 31-33.
employed. Readers are cautioned that an interpretation of the findings should be restricted to the actual participants, pending confirmation in other populations where more powerful sampling methods have been employed.

Data collection was accomplished in a variety of settings and the respondents were asked to complete the four questionnaires without external assistance. Interviewers typically were present, however, and were instructed to answer any questions within the prescribed boundaries of their training. Approximately 10 percent of the respondents completed the questionnaires at their homes after receiving directions from the interviewer. This variation, although posing a threat of methodological artifacts, was required by stipulations set forth by Human Subjects Program Guidelines within the university. In effect, participants had to be allowed the luxury of alternative means of participation and such alternatives had to be explicitly identified.

Consideration was given to the use of mailed questionnaires due to the relative amount of participation required for subjects. It was recognized that on-site participation would involve considerable time and effort both for respondents and interviewers. However, mail techniques typically involve major response attrition, slower data return, and problems of non-response bias. 67 Therefore, the potential

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inefficiencies associated with the use of the mails were ignored in favor of the greater expected degree of respondent control made possible through administration of the schedules on a group basis.

In order to provide a reasonable sub-sample size and to allow for respondent attrition, the survey was planned with a goal of three hundred sample units. In setting such a goal, it was recognized that the Q-sort method could be considered as producing interval data responsive to parametric statistical analysis, but that the Q-sort method did not require inordinately large samples. To allow for analytic discretion, sub-sample sizes of approximately seventy-five were planned.

In the end, the usable sample was two hundred eighty-three, or 94.33 percent of the goal. Five questionnaire packets were returned virtually incomplete, and had to be discarded. Non-usable packets constituted 1.76 percent of the actual sample.


69 The small number of non-usable returns precluded meaningful Chi square analysis for non-response bias. Two respondents later volunteered sight difficulties as the reason for not completing the questionnaires. Two other non-usable packets, with age filled in, were from persons age sixty-five and over. One may speculate that nonresponse for the second two may have resulted from poor eyesight, confusion, and reading difficulties. Nothing could be determined about the last non-usable packet. Fortunately, the five were distributed over all four sub-samples, reducing the magnitude of non-response bias possibilities in any given sub-sample.
Respondents were limited to individuals twenty years or older. In addition, the sample was unrepresentative of the total population in that persons were excluded by virtue of the sampling procedure. Specifically, the sample excluded:

1. Institutionalized persons,
2. Those outside a singular middle-western urban area,
3. Military personnel stationed outside the sample boundaries,
4. Itinerants within the sample boundaries,
5. Functional illiterates,
6. Active practicing physicians,
7. People out of town during the sampling period.

Although unplanned, non-whites, especially blacks, were especially reluctant to participate.

In presenting the study to respondents, an explanation was provided to the effect that the survey was part of a larger national study of people's feelings about medical care in general. Before the participants were permitted to begin, it was explained that the results of the project would aid health planners develop plans for future health service needs. Such a tact appeared to aid in gaining participation without unnecessarily jeopardizing the real intent of the investigation. This guise also resulted from intuitive feelings obtained during the pilot tests that people appear to

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70 Efforts were made to access each geographic area within the urban area. Blacks resisted participation and refused to provide any explanation for refusal.

71 In many cases respondents wanted to see the study before volunteering. Interviewers were instructed to allow examination, but withhold major explanations until they received an indication of willingness.
recoil at participation in "drug" studies because of certain threatening attributes.

Procedures and Treatments

After assembling the questionnaire sets, including the four questionnaires and the participation consent form, each packet was placed inside an unmarked envelope. This technique provided a means of concealing which type of Antibiotic Preference questionnaire was contained within the envelope, thus eliminating potential interviewer effects\textsuperscript{72} on respondent assignment to groups.

Before respondents actually opened the packets, interviewers gave a brief description of the study. Special emphasis was placed on the fact that participation was anonymous, and that names would not be released with any subsequent results. As a further assurance of anonymity, it was pointed out that the consent forms could be returned separately from the completed questionnaires. Finally, interviewers instructed respondents not to indicate their name on any of the questionnaires or the envelope. This instruction was also corroborated on the directions accompanying each questionnaire.

Once the general instructions had been completed, the subject was instructed to examine the entire packet contents.

In order, the specific directions indicated that:

1. Participation was totally voluntary.

2. Subjects should understand both the amount and type of participation required before beginning.

3. No respondent would be asked to take medicines of any kind during or after participation.

4. If for any reason, subjects felt uneasy about answering individual questions, then the proper procedure was to simply cross out the entire question.  

5. Except for a few questions covering personal characteristics, the rest involved personal judgments. In addition, respondents should not seek any particularly "right" answers, for the right answer was the one with which the subject most agreed.

6. To protect participant identity, questions subsequent to the start of the interview would be handled on a private basis with the interviewer.

7. Respondents should understand these directions before the session began.

8. The interviewer would provide an explanation of the entire study once the session was complete and all

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73 This procedure was instituted to assess which questions were skipped and which were considered but declined.

74 In reality this direction was to protect the sub-sample structure when respondents were accommodated in group settings.
packets were returned.\textsuperscript{75}

(9) Respondents could withdraw their consent to participate any time up until the completed packets were returned to the interviewer.\textsuperscript{76}

(10) If on-site participation was inconvenient or an imposition on the participant, alternative participation was possible. This secondary means consisted of completing the questionnaires in any other private environment of the respondent's choosing. Return of the completed materials was to be handled through mutual arrangements with the interviewer or through the mails with postage provided by the investigator. Necessarily, subjects choosing the alternative means of participation would receive debriefing at a later, convenient time.\textsuperscript{77,78}

Once the respondents had completed the entire battery of questionnaires, returned them to the unmarked envelopes, and transmitted the entire packet to the interviewer, a debriefing session was conducted, but only if the respondent so desired.

As the completed questionnaires were assembled, they were coded, first on the actual form then on standard coding

\textsuperscript{75}Stipulation of university Human Subjects Program Guidelines.  
\textsuperscript{76}Ibid.  
\textsuperscript{77}Ibid.  
\textsuperscript{78}Although alternative participation slowed data return, no packets were lost in the mails or \textbf{not} returned.
sheets, and finally punched on data cards. Coding was completed by the principal investigator and one interviewer. In the interest of objectivity, questionable responses were coded as missing data, i.e., zero. Following coding sheet verification, key-punching was completed by full-time university key-punch personnel who verified all results. Final verification of the cards against the coding sheets by the investigator failed to identify any errors.

As noted above, the sub-sample structure developed to accommodate the various forms of the AP instrument constituted the experimental phase of the inquiry. Specifically, the study design facilitated random assignment of respondents into one of four sub-samples based upon a predetermined form of the AP questionnaire. The design may be characterized as a post-test only, with control group. The general design of the experimental format is represented in Figure 4.

The groups are constituted as control and experimental

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80 Ibid.
components of the design. Observations, in this case preference measures, are made for both groups after the treatment intervention has been instituted. The relevant analysis centers upon statistical differences between the observations made on the two groups. 81

The critical assumption, owing to the absence of pre-test measures is the initial equivalence of both samples. Campbell and Stanley argued that the "... most adequate all-purpose assurance of lack of initial biases between groups is randomization." 82 In addition, the authors noted that randomization and the post-test only, with control group may be superior to a Solomon Four-Group Design, especially if pretests are likely to be reactive with final results. 83 It was felt that the design adopted represented the best solution to the anticipated problems of pretest reactive effects on the final observations.

The current study differed slightly from the Campbell and Stanley design in that there were two control and two experimental groups. The basic design was not altered, but parallel designs were developed to study preference patterns of the antibiotics for self-use and use by another.

Respondents in the first control group made decisions based upon the AP form which lacked treatment intervention.

and also specified that the antibiotics were for self-use (see Appendix E). The first experimental group respondents also made decisions within the context of personal use of the drugs, but were exposed to treatment intervention (see Appendix F). In specific terms, the predecision treatment consisted of a hypothetical excerpt from a non-existent medical journal. The author of the excerpt was described as a professor of medicine at an American medical college. The content of the excerpt included the physician's opinion that the newer antibiotics were more effective. The intent of the intervention was to observe shifts of preference which may have resulted from additional information relating to the relative benefits to be expected from the various antibiotics.

The preference decisions rendered by the participants in the second control and experimental groups were accomplished under the aegis of deciding for an "other." To encourage respondents to consider the "other" under like circumstances, the description of the other was identical in each group (see Appendices G and H). The intent of the second full experimental design derived from the results of studies completed to observe the variations in risk acceptance when the decision was made as a personal one in contrast to action on behalf of another. Results indicated that risk acceptance

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drops significantly when the decision-maker is acting as an agent for a second party. Because young children are often recipients of prescription drugs wherein decisions are made by adults, such a design was deemed important.

It was concluded that a "neutral" child, i.e., one not linked by blood line to the respondent but still significant to the subject, would be used. In such a manner, all respondents would be placed on a similar perceptual plane and differences in the respondents' familial states would be minimized.

A short vignette was incorporated in the directions accompanying the second control and experimental AP forms (see Appendices G and H). As in the first group, the intent of the description was to place the respondent in a controlled decision-making environment. It was explained that the respondent had been caring for a neighbor's "toddler" while the neighbors were vacationing. The implication was that the respondent was acting as a temporary guardian, hence a decision on behalf of the child would be appropriate. In no case did a respondent question the propriety of such a decision environment, in fact, they took the assignment quite seriously. 85, 86

85 A major concern in the development of all AP materials was to maximize face validity through encouraging realistic situations. Respondents appeared to adopt the simulations as real based upon comments recorded after the interview sessions. In several cases, people remarked that they did not envy the physician's responsibility in making such decisions.

86 The composition of the various decision environments and the treatment characteristics do not exhaust the possible dimensions of such
Considerations for Analysis

Analysis of the data focused upon the differences in the individual preferences for each antibiotic between the appropriate control and experimental group results. Substantial attention was paid to the observed differences between the results of sub-sample $C_1$ and $E_1$, and $C_2$ and $E_2$. In addition, analyses were completed between the respective groups across the "self" and "other" environments, viz., $C_1$ and $C_2$; $E_1$ and $E_2$.

A secondary level of analysis was directed at the preference effects of the three antibiotic attributes within a singular sub-sample, e.g., $C_1$. Finally, the remaining variables resulting from the other questionnaires were utilized as control variables in attempting to better understand the observations made in the four sub-samples.

It was expected that the experimental treatments would produce significant changes in the reported preferences for the individual antibiotics when viewed against the appropriate control group. In addition, the preferences for antibiotics for self-use were expected to be quite different than when intervention. For instance, varying the descriptions of the "other" may have produced entirely different results. Similarly, changes in the treatment content or message source may have modified the outcomes. Future efforts might provide useful insights by substituting a pharmacist, drug manufacturing representative, FDA official, or expert drug researcher within the same research framework.

Because of the complexity of the design and the number of possible analyses which could have been developed, the study represents a potential basis for additional interpretation by utilizing other methods of data analysis.
the decision was rendered on behalf of the child. The use of
the remaining variables as controls to re-examine the pref-
erences allowed for the testing of the hypotheses was pre-
sented in Chapter III.

Most of the variables obtained from the study were
readily identified as possessing characteristics of ordinal
measurement. Age and gender, however, only attain the
level of nominal measures. Stephenson argued that Q-sort
methods produce interval measures, but appropriate para-
metric methods of analysis were discarded because of an
interest in conservatism and the inability to ignore scale
level requirements of such powerful statistical procedures.

88 Miller, Handbook of Research Design and Social Measurement, p. 137.
89 Ibid.
90 Stephenson, "Study of Behavior."
91 Paul E. Green, Michele H. Halbert, and Patrick J. Robinson,
"Canonical Analysis: An Exposition and Illustrative Application,"
Journal of Marketing Research 3 (February 1966) pp. 32-39; Michael
Perry and B. Curtis Hamm, "Cannonical Analysis of Relations Between
Socioeconomic Risk and Personal Influence in Purchase Decisions,"
Journal of Marketing Research 6 (August 1969), pp. 351-54; Jagdish N.
Sheth and J. Scott Armstrong, "Factor Analysis in Marketing Data,
ed. Phillip F. McDonald, Marketing's Involvement in Society and the
92 For cogent arguments supporting the idea of treating ordinal
and nominal data as higher level measures regardless of failure to
achieve consensus of the data characteristics, the reader is directed
to Miller, Handbook of Research Design, p. 91 and Pessemier and Teach,
The AP results were interpreted as not reaching the level of continuous data in light of the fact that the design did not satisfy the requirements of a random probability sample. In addition, the remaining variables definitely failed to meet the assumptions of continuous data. Hence, the analysis was completed using several distribution-free statistical methods.
CHAPTER V

STUDY FINDINGS

A brief description of the general characteristics of the sub-sample participants is provided as a background for appraising the validity of the findings.

GENERAL RESULTS

A total of two hundred eighty-three respondents completed the battery of questionnaires. Random assignment of participants into the individual sub-sample resulted in unequal but similar N's. Specifically, the sub-sample breakdown was: (1) first control group, N=70, (2) first experimental group, N=75, (3) second control group, N=68, and (4) second experimental group, N=70.

In general the four sub-samples were matched in terms of demographic attributes (see Table 1). Chi-square contingency table analysis indicated that the observations recorded across the four groups were within the bounds of chance, with the exception of the gender distribution of sub-sample E2 (see Table 1).1

### TABLE 1

**SUMMARY STATISTICS OF GENERAL RESPONDENT CHARACTERISTICS BY TYPE OF SUB-SAMPLE**

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Sub-Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C₁</td>
</tr>
<tr>
<td><strong>Subject Age</strong></td>
<td></td>
</tr>
<tr>
<td>20-35 years</td>
<td>34²⁻ 48.6%</td>
</tr>
<tr>
<td>Over 35 years</td>
<td>36 - 51.4%</td>
</tr>
<tr>
<td><strong>Subject Gender</strong></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>19²⁻ 27.1%</td>
</tr>
<tr>
<td>Female</td>
<td>51 - 72.9%</td>
</tr>
<tr>
<td><strong>Subject SES</strong></td>
<td></td>
</tr>
<tr>
<td>Median Index</td>
<td>67.4⁴⁻</td>
</tr>
<tr>
<td><strong>CDQ Index</strong></td>
<td></td>
</tr>
<tr>
<td>Median Index</td>
<td>5.47⁵⁻</td>
</tr>
</tbody>
</table>

² Frequency count of respondents reporting a value within a particular sub-sample.

³ Relative percentage of respondents reporting a value within a particular sub-sample.

³ Chi-square analysis indicated that the observed frequencies of the sub-samples did not differ significantly from chance at p<.05, except in the case of gender in group E₂. The E₂ gender distribution differed from the remaining sub-samples at p<.05 but not p<.01.

⁴ Median SES index value resulting from three-factor calculation. Variation across sub-samples within limits of chance at p<.01.

⁵ Median Choice Dilemma Questionnaire value within a particular sub-sample. Variation across sub-samples within limits of chance at p<.01.
Tables 2 and 3 summarize the results from the PEQ questions dealing with product interest and purchase decision importance. As expected, the antibiotic product held an interest for the respondents across all groups in relation to the remaining products. In addition, products which are typically used internally tended to be more interesting to respondents than were externally-used products. Table 3 indicates that respondents generally considered the antibiotic as an important purchase decision relative to the remaining products, and such importance was constant over all groups.

### TABLE 2

**RELATIVE INTEREST IN FIVE PRODUCTS**

<table>
<thead>
<tr>
<th>Product</th>
<th>C1</th>
<th>E1</th>
<th>C2</th>
<th>E2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antibiotic</td>
<td>2.6a</td>
<td>2.4</td>
<td>2.8</td>
<td>2.6</td>
</tr>
<tr>
<td>Headache Remedy</td>
<td>2.1</td>
<td>2.1</td>
<td>2.2</td>
<td>2.3</td>
</tr>
<tr>
<td>Bread</td>
<td>2.1</td>
<td>2.6</td>
<td>2.3</td>
<td>2.4</td>
</tr>
<tr>
<td>Deodorant</td>
<td>1.8</td>
<td>1.6</td>
<td>1.6</td>
<td>1.8</td>
</tr>
<tr>
<td>Tissue</td>
<td>1.3</td>
<td>1.3</td>
<td>1.1</td>
<td>1.0</td>
</tr>
</tbody>
</table>

*Index of "interest" in each product within a particular sub-sample. Index represents total number of times a product was chosen as more interesting over all pairs and averaged by the number of respondents. Possible maximum score is 4; minimum 1.*
Underarm deodorant, although less interesting, was considered to be a purchase decision of similar importance as headache remedies; whereas, bread was considered less important than either (see Table 3).

**TABLE 3**

**MEDIAN IMPORTANCE OF PURCHASE DECISION FOR FIVE PRODUCTS BY TYPE OF SUB-SAMPLE**

<table>
<thead>
<tr>
<th>Product</th>
<th>Sub-Sample</th>
<th>Weighted Median</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C1</td>
<td>E1</td>
</tr>
<tr>
<td>Headache Remedy</td>
<td>4.96</td>
<td>4.91</td>
</tr>
<tr>
<td>Deodorant</td>
<td>4.97</td>
<td>4.91</td>
</tr>
<tr>
<td>Bread</td>
<td>3.50</td>
<td>3.81</td>
</tr>
<tr>
<td>Tissue</td>
<td>2.62</td>
<td>2.65</td>
</tr>
</tbody>
</table>

N=70  N=75  N=68  N=70  N=283

*Median scale value of importance of respondents reporting a value within a particular sub-sample.

b Intra-sample medians for all samples produced non-significant Mann-Whitney U's with the weighted medians for all products.

Table 4 summarizes the purchase frequencies of the selected products. The intervals within the third question of the PEQ were collapsed to provide gross measures of purchase frequency. Again, the four sub-samples produced results within the bounds of chance with the exception of E2 as noted in Table 4.
### TABLE 4

**SUMMARY FREQUENCIES OF PURCHASE CYCLE OF FIVE PRODUCTS BY TYPE OF SUB-SAMPLE**

<table>
<thead>
<tr>
<th>Product</th>
<th>Sub-Sample</th>
<th>C1</th>
<th>E1</th>
<th>C2</th>
<th>E2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antibiotic</td>
<td>≥ Monthly</td>
<td>5 a</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>&lt; Monthly</td>
<td>65</td>
<td>73</td>
<td>67</td>
<td>66</td>
</tr>
<tr>
<td>Headache Remedy</td>
<td>≥ Monthly</td>
<td>33</td>
<td>31</td>
<td>32</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>&lt; Monthly</td>
<td>37</td>
<td>44</td>
<td>36</td>
<td>56</td>
</tr>
<tr>
<td>Deodorant</td>
<td>≥ Monthly</td>
<td>36</td>
<td>41</td>
<td>32</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>&lt; Monthly</td>
<td>34</td>
<td>34</td>
<td>36</td>
<td>31</td>
</tr>
<tr>
<td>Bread</td>
<td>≥ Monthly</td>
<td>62</td>
<td>71</td>
<td>62</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td>&lt; Monthly</td>
<td>6</td>
<td>4</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Tissue</td>
<td>≥ Monthly</td>
<td>36</td>
<td>40</td>
<td>44</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>&lt; Monthly</td>
<td>34</td>
<td>30</td>
<td>24</td>
<td>32</td>
</tr>
</tbody>
</table>

a Frequency counts of respondents reporting a value.

b Relative percentage of respondents reporting a value.

c Chi-square analysis indicated that the observed frequencies of the sub-samples did not differ significantly from chance at p<.05, except that the distribution of frequency of purchase of headache remedy in the E2 sub-sample differed significantly from the other sub-samples at p<.05 but not p<.01.
The purchase frequency of the antibiotic was in the expected direction relative to the remaining products, and, although not reported in detail, the consumption frequency of antibiotics, in terms of relative usage, reconciled with the results in Table 4.

From the general results, it was concluded that the four sub-samples were adequately matched in terms of pretreatment equality. Further, the antibiotic represented a product which was relatively interesting, important, and infrequently purchased and consumed when compared to the remaining "drug" products.

Participants reported total lifetime prescription drug consumption patterns which were congruent with the results presented in Table 4. More specifically, the respondents' general prescription drug experience patterns, as noted in Table 5, indicated that a substantial number of respondents had taken fewer than five different major types of drugs during their entire lifetimes. Of course, such a measure must be interpreted in light of the high probability of distortions of memory, and the fact that not all drugs were represented in the measure. However, the crucial observation establishes that approximately half of the participants reported having taken antibiotics, while half had not. Also, the experience dispersion was within bounds of chance for all groups for the general prescription drug experience measure (see Table 5).
TABLE 5
SUMMARY FREQUENCIES OF SUB-SAMPLE PRESCRIPTION CONSUMPTION EXPERIENCE

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Sub-Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C₁</td>
</tr>
<tr>
<td>Prescription</td>
<td></td>
</tr>
<tr>
<td>Drug Experience</td>
<td></td>
</tr>
<tr>
<td>0-4 types</td>
<td>29&lt;sup&gt;a&lt;/sup&gt; - 41.4%</td>
</tr>
<tr>
<td>5 or more</td>
<td>41 - 58.6</td>
</tr>
<tr>
<td>Antibiotic Experience</td>
<td></td>
</tr>
<tr>
<td>Had not taken</td>
<td>12 - 17.1%</td>
</tr>
<tr>
<td>Had taken</td>
<td>58 - 82.9</td>
</tr>
<tr>
<td>Penicillin Experience</td>
<td></td>
</tr>
<tr>
<td>Had not taken</td>
<td>19 - 27.1%</td>
</tr>
<tr>
<td>Had taken</td>
<td>51 - 72.9</td>
</tr>
</tbody>
</table>

|                | N=70 | N=74 | N=68 | N=70 |

<sup>a</sup>Frequency counts of respondents reporting a value within a particular sub-sample.

<sup>b</sup>Relative percentage of respondents reporting a value within a particular sub-sample.

<sup>c</sup>Chi-square analysis indicated that the observed frequencies of sub-sample C₂ were significantly different than those observed in sub-samples C₁ and E₁ at p<.05 but not at p<.01.

<sup>d</sup>Chi-square analysis indicated that the observed frequencies of sub-sample E₂ were significantly different than those observed in sub-samples C₁ and E₁ at p<.05 but not at p<.01.
Table 6 represents the distribution of experience with tangible side effects across the four sub-samples. For both general side effects and specific experience with antibiotics, the across-group variation was within the limits of chance. However, in virtually every case the number of respondents who recalled untoward reactions to prescription drugs was a minority (see Table 6).

As may be noted from an examination of Tables 5 and 6, several inter-sample distribution anomalies were reported (see footnotes Tables 5 and 6). To date it is not known whether such outcomes were derived from underlying sub-sample inequalities or were reflective of artifacts resulting from the questionnaire itself or the subsequent scoring method. Nevertheless, the measures used to test hypotheses, e.g., general prescription drug experience and side effect experience, were statistically uniform across all four sub-samples.

Findings based upon the various Q-sort procedures within each particular sub-sample are reported in Table 7. In each case, the median within-sample preference score is recorded. The results in Table 7 represent 3,396 individual decisions made by the participants, thus affording analysis on a considerable base of data.

\[^2\text{It should be noted that no effort was made to assess the type, frequency, severity, or outcome of the attendant drug reactions. Informal post-hoc discussions with respondents, however, indicated to the investigator that such effects were quickly and specifically described as though they had just occurred.}\]
## TABLE 6
SUMMARY FREQUENCIES OF SUB-SAMPLE
SIDE EFFECT EXPERIENCE

<table>
<thead>
<tr>
<th>Attribute</th>
<th>C1</th>
<th>E1</th>
<th>C2</th>
<th>E2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prescription Side Effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No side effects</td>
<td>42(^a) -41.4(^b)%</td>
<td>36 -48.6%</td>
<td>28 -41.2%</td>
<td>33 -47.1%</td>
</tr>
<tr>
<td>Had side effects</td>
<td>28 -40.0</td>
<td>38 -51.4</td>
<td>40 -58.5</td>
<td>37 -52.9</td>
</tr>
<tr>
<td>Antibiotic Side Effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No side effects</td>
<td>55 -78.6%</td>
<td>59 -79.7%</td>
<td>52 -76.5%</td>
<td>56 -80.0%</td>
</tr>
<tr>
<td>Had side effects</td>
<td>15 -21.4</td>
<td>15 -20.3</td>
<td>16 -23.5</td>
<td>14 -20.0</td>
</tr>
<tr>
<td>Penicillin Side Effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No side effects</td>
<td>60 -85.7%</td>
<td>67 -90.5%</td>
<td>59 -86.8%</td>
<td>63 -90.0%</td>
</tr>
<tr>
<td>Had side effects</td>
<td>10 -14.3</td>
<td>7 -9.5</td>
<td>9 -13.2</td>
<td>7 -10.0</td>
</tr>
</tbody>
</table>

\(^a\) Frequency counts of respondents reporting a value within a particular sub-sample.

\(^b\) Relative percentage of respondents reporting a value within a particular sub-sample.

\(^c\) Chi-square analysis indicated that the observed frequencies of all measures across the four sub-samples did not differ from chance at \(p<.05\).
<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>Sub-Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C₁</td>
</tr>
<tr>
<td>LK2307</td>
<td>1.40ᵃ</td>
</tr>
<tr>
<td>KP2935</td>
<td>2.79</td>
</tr>
<tr>
<td>LM3407</td>
<td>3.30</td>
</tr>
<tr>
<td>LN3722</td>
<td>2.67</td>
</tr>
<tr>
<td>LP3742</td>
<td>1.42</td>
</tr>
<tr>
<td>NL3855</td>
<td>6.14</td>
</tr>
<tr>
<td>LP4321</td>
<td>1.08</td>
</tr>
<tr>
<td>KL4609</td>
<td>4.91</td>
</tr>
<tr>
<td>KM4678</td>
<td>6.81</td>
</tr>
<tr>
<td>LP5209</td>
<td>5.32</td>
</tr>
<tr>
<td>LM5127</td>
<td>1.69</td>
</tr>
<tr>
<td>ML5321</td>
<td>4.28</td>
</tr>
<tr>
<td>N=70</td>
<td>N=75</td>
</tr>
</tbody>
</table>

ᵃMedian scale value resulting from Q-sort procedures within a particular sub-sample.
ANALYTIC FINDINGS

The Mann-Whitney U statistic\(^3\) was used to address the tenability of \(H_1\) and \(H_2\).\(^4\) In doing so, \(H_1\), which proposed that the persuasive intervention would produce a significant shift in preference, was examined in two separate phases. The preference distributions of each antibiotic were compared first across samples \(C_1\) to \(E_1\) and secondly across \(C_2\) to \(E_2\). A hypothesis of no difference between the respective twelve distribution comparisons was examined using the Mann-Whitney U and a critical Z value of 1.65 for \(p \leq .05\) and \(Z=2.33\) for \(p \leq .01\).\(^5\) The results of the twenty-four distinct tests are reported in Table 8.

Examination of the results indicated that \(H_0\) was rejected in only one case for the \(C_1 - E_1\) comparisons; hence, \(H_1\) received minimal support. On the other hand, \(H_0\) was rejected in six cases for the \(C_2 - E_2\) comparisons. In all, the predicted effect of the experimental treatment was supported in seven of the twenty-four comparisons. The merit

\(^3\)Downie and Heath, Basic Statistical Methods, pp. 240-43; and Hollander and Wolfe, Nonparametric Statistical Methods, p. 71; and Siegel, Nonparametric Statistics for the Behavioral Sciences, pp. 116-27.

\(^4\)Though the data may have allowed for the use of Kruskal-Wallis one-way analysis of variance, the attractive power-efficiency of the Mann-Whitney U provided an excellent alternative which did not require the assumption of underlying continuous distribution of the data.

of $H_1$ remains in doubt in view of the relatively few but strong effects recorded.

### TABLE 8

RESULTS OF MANN-WHITNEY U ANALYSIS
OF $H_1$ FOR ANTIBIOTIC PREFERENCE

<table>
<thead>
<tr>
<th>Antibiotic Producing Significant U's</th>
<th>Analytic Focus</th>
<th>Between $C_1$ and $E_1$</th>
<th>Between $C_2$ and $E_2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>LM3407</td>
<td></td>
<td>Preference Increase*</td>
<td>Preference Increase**</td>
</tr>
<tr>
<td>LN3722</td>
<td></td>
<td>Preference Increase**</td>
<td>Preference Increase**</td>
</tr>
<tr>
<td>LP3742</td>
<td></td>
<td>Preference Increase**</td>
<td>Preference Increase**</td>
</tr>
<tr>
<td>NL3855</td>
<td></td>
<td>Preference Increase**</td>
<td>Preference Increase**</td>
</tr>
<tr>
<td>KL4609</td>
<td></td>
<td>Preference Increase**</td>
<td>Preference Increase**</td>
</tr>
<tr>
<td>KM4678</td>
<td>Preference Decrease**</td>
<td>Preference Increase**</td>
<td>Preference Increase**</td>
</tr>
<tr>
<td>ML5321</td>
<td></td>
<td>Preference Increase**</td>
<td>Preference Increase**</td>
</tr>
</tbody>
</table>

* Observed frequency distributions produced an U value which was significant at $p \leq .05$.

** Observed frequency distributions produced an U value which was significant at $p \leq .01$.

An identical analytic framework was utilized to assess the merit of $H_2$, which proposed that preference for individual antibiotics would be significantly different between the "self" and "other" decision environments. The results are reported in Table 9. Rejection of $H_0$ was recorded six times in the twenty-four replicated analyses, but again the significant shifts in preference were beyond $p \leq .01$. As before, the
<table>
<thead>
<tr>
<th>Antibiotic Producing Significant U's</th>
<th>Analytic Focus</th>
<th>Between C&lt;sub&gt;1&lt;/sub&gt; and C&lt;sub&gt;2&lt;/sub&gt;</th>
<th>Between E&lt;sub&gt;1&lt;/sub&gt; and E&lt;sub&gt;2&lt;/sub&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>LN3722</td>
<td>Preference Decrease**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LP3742</td>
<td>Preference Decrease**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NL3855</td>
<td>Preference Decrease**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KM4678</td>
<td>Preference Increase**</td>
<td></td>
<td>Preference Increase**</td>
</tr>
<tr>
<td>LP5209</td>
<td>Preference Increase**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ML5321</td>
<td>Preference Decrease**</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Observed frequency distributions produced an U value which was significant at \( p \leq .01 \).

Assessment of \( H_2 \) provided an inadequate basis for drawing irrevocable conclusions about the merit of the hypothesis.

Assessment of hypotheses 3, 4, and 5 was accomplished simultaneously by virtue of the methodology employed.\(^6\) Emphasis was directed toward isolating the individual effect of each antibiotic characteristic on preference. In view of the

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similarity of results across sub-samples as indicated above, only one sub-sample, C\textsubscript{1}, was analyzed. This decision was supported by the fact that the C\textsubscript{1} group had undergone the fewest outside influences as controlled by the study design.

The preference scale values were collapsed, as indicated in Table 10, and the data were arranged within the table to correspond to the intent of the effect model displayed in Figure 5. To separate the effects of the amount of time a drug had been available from the restrictions on the use of the drug, two separate multivariate analyses were undertaken.

\textbf{Figure 5} Preference Effect Model

Initially, the first eight antibiotics displayed in Table 10, reading from left to right, were analyzed. The resulting "b" coefficients are included in Table 11, with \( b_{\text{me-age}} \) representing the effect of the length of market experience on preference for the antibiotics, and \( b_{\text{se}} \) and \( b_{\text{p}} \) representing the effect of side effect and price, respectively.
### TABLE 10

RELATIVE PREFERENCE FOR TWELVE ANTIBIOTICS WITHIN THE C₁ SUB-SAMPLE

<table>
<thead>
<tr>
<th>Market Experience</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ten Years General Use</td>
<td>New General Use</td>
<td>New Experimental</td>
<td></td>
</tr>
<tr>
<td>Rash</td>
<td>Ulcer</td>
<td>Rash</td>
<td>Ulcer</td>
</tr>
<tr>
<td>Price</td>
<td>$2.95</td>
<td>$8.85</td>
<td>$2.95</td>
</tr>
<tr>
<td>Prefer</td>
<td>65</td>
<td>44</td>
<td>14</td>
</tr>
<tr>
<td>Not Prefer</td>
<td>5</td>
<td>26</td>
<td>56</td>
</tr>
</tbody>
</table>

*The raw Q-sort frequency intervals were collapsed so that scale values of "5" through "7" equaled "prefer," and scale values of "1" through "4" equaled "not prefer." Cells represent frequencies.*

*Attribute arrangement corresponds to model in Figure 5.*
TABLE 11
COLEMAN MULTIVARIATE ANALYSIS OF THE EFFECT OF ANTIBIOTIC ATTRIBUTE ON ANTIBIOTIC PREFERENCE FOR SAMPLE C

<table>
<thead>
<tr>
<th>Coleman Coefficient</th>
<th>Antibiotics Compared</th>
<th>Antibiotics 1 to 8&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Antibiotics 5 to 12&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>.032&lt;sup&gt;g&lt;/sup&gt;</td>
<td>***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>***</td>
<td>.257&lt;sup&gt;g&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.632&lt;sup&gt;g&lt;/sup&gt;</td>
<td>.489&lt;sup&gt;g&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.196&lt;sup&gt;g&lt;/sup&gt;</td>
<td>.178&lt;sup&gt;g&lt;/sup&gt;</td>
</tr>
<tr>
<td>b&lt;sub&gt;total&lt;/sub&gt;&lt;sup&gt;c&lt;/sup&gt;</td>
<td></td>
<td>.860</td>
<td>.924</td>
</tr>
<tr>
<td>a&lt;sup&gt;d&lt;/sup&gt;</td>
<td></td>
<td>.044</td>
<td>-.155&lt;sup&gt;f&lt;/sup&gt;</td>
</tr>
<tr>
<td>c&lt;sup&gt;e&lt;/sup&gt;</td>
<td></td>
<td>.096&lt;sup&gt;f&lt;/sup&gt;</td>
<td>***</td>
</tr>
</tbody>
</table>

<sup>a</sup> Represents analysis of the first eight antibiotics in Table 10, controlling for each variable's effect on preference.

<sup>b</sup> Represents analysis of the fifth to twelfth antibiotics in Table 10, controlling for each variable's effect on preference.

<sup>c</sup> Total effect explained by three variables.

<sup>d</sup> Random shock into the "prefer" category.

<sup>e</sup> Random shock out of the "prefer" category.

<sup>f</sup> Neither model is additive, thus indicating the presence of interaction effects.

<sup>g</sup> All b effects were significant at p ≤ .05.
A secondary examination was made of the fifth through twelfth antibiotics, reading from left to right in Table 10, to isolate the effect of usage restrictions on preference for the antibiotics. The result of that analysis is reported in Table 11, with $b_{me-use}$ representing the effect of whether a drug is described as being for general or experimental use on preference.

All six "b" coefficients were significant at $p \leq .05$, and at $p \leq .01$, thus strongly supporting both the effects model in Figure 5 and the third, fourth, and fifth hypotheses of the study. In addition, the first analysis resulted in a combined explanation of variance of $b_{total} = .860$; whereas, the second analysis provided a $b_{total} = .924$.

Random shock into the "prefer" category was only $a = .044$ in the first analysis, indicating a small degree of unexplained variance, and the random shock out of the "prefer" category was $c = .096$ (see Table 11, left side). The second comparison produced random shock into the "prefer" category which when added to the $b_{total}$ exceeded one-hundred percent. Such a result leads to the conclusion that the model, and hence the individual attributes, is not additive, ipso facto. Followup analysis of the first comparison provided substantial evidence that the model is not additive at

$7$Significance was tested using standard error of a percentage as detailed by Downie and Heath, pp. 124, 293.
Therefore, in assessing the plausibility of the three hypotheses, several observations proved essential. First, the analysis supported $H_3$, but antibiotic age explained approximately one-eighth of the variance as did the general versus experimental use. The influence of side effect on preference was considerable, thus supporting $H_5$. However, side effect severity explained less variance when the drug had restricted use, than when use was unlimited. This observation may be the key to the non-additivity of the model. Finally, price affected preference, with the preference declining as price increased. Hence, $H_4$, the supposition that antibiotic preference is inversely related to price, was supported by both analyses.  

The final level of analysis focused on the remaining hypotheses as a group. Spearman Rank Order Correlation Coefficients were used in assessing the merits of the final six hypotheses. Specifically, forty-eight $r$'s were generated for each variable in question over the four sub-samples. The results, together with an indication of the significant relations, are presented by sub-sample in Tables 12 through 15.

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9 Although excluded from the formal report of the study, the results were further corroborated through inter-drug correlation analysis. The reader is directed to Appendix I for the actual results.

### TABLE 12
SPEARMAN RANK ORDER CORRELATIONS OF ANTIBIOTIC PREFERENCE AND SELECTED CONTROL VARIABLES FOR SAMPLE C

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>RXUSE</th>
<th>RXSE</th>
<th>GENDER</th>
<th>AGE</th>
<th>TOCCO</th>
<th>SES</th>
</tr>
</thead>
<tbody>
<tr>
<td>RX-LK2307</td>
<td>-.01</td>
<td>.05</td>
<td>-.24*</td>
<td>-.23*</td>
<td>.05</td>
<td>-.04</td>
</tr>
<tr>
<td>RX-KP2935</td>
<td>-.08</td>
<td>.10</td>
<td>-.03</td>
<td>-.07</td>
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<td>-.05</td>
</tr>
<tr>
<td>RX-LM3407</td>
<td>-.01</td>
<td>-.01</td>
<td>-.18</td>
<td>-.02</td>
<td>-.16</td>
<td>.04</td>
</tr>
<tr>
<td>RX-LN3722</td>
<td>.02</td>
<td>-.10</td>
<td>-.03</td>
<td>-.13</td>
<td>.05</td>
<td>-.15</td>
</tr>
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<td>RX-LP3742</td>
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<td>.09</td>
<td>.17</td>
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<td>RX-NL3855</td>
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<td>.05</td>
<td>-.02</td>
<td>-.01</td>
<td>-.03</td>
</tr>
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<td>RX-LP4321</td>
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<td>-.12</td>
<td>-.08</td>
<td>-.13</td>
<td>.00</td>
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<td>RX-KL4609</td>
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<td>-.30**</td>
<td>-.19</td>
<td>-.15</td>
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<tr>
<td>RX-LP5209</td>
<td>-.06</td>
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<td>-.41**</td>
<td>-.21*</td>
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<td>.11</td>
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<td>RX-LM5127</td>
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<td>-.23*</td>
<td>-.15</td>
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<td>.03</td>
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<tr>
<td>RX-ML5321</td>
<td>.01</td>
<td>.04</td>
<td>-.02</td>
<td>.18</td>
<td>-.06</td>
<td>.09</td>
</tr>
</tbody>
</table>

*Correlation is significant at p ≤ .05.

**Correlation is significant at p ≤ .01.
**TABLE 13**

**SPEARMAN RANK ORDER CORRELATIONS OF ANTIBIOTIC PREFERENCE AND SELECTED CONTROL VARIABLES FOR SAMPLE E**

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>RXUSE</th>
<th>RXSE</th>
<th>GENDER</th>
<th>AGE</th>
<th>TOTCGQ</th>
<th>SES</th>
</tr>
</thead>
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<td>.10</td>
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<td>RX-KP2935</td>
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<td>.21*</td>
<td>.18</td>
<td>-.01</td>
<td>-.03</td>
<td>.14</td>
</tr>
<tr>
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<td>-.08</td>
<td>-.09</td>
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<td>-.17</td>
</tr>
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<td>.11</td>
</tr>
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<td>-.08</td>
<td>-.01</td>
<td>-.17</td>
</tr>
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<td>RX-NL3855</td>
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<td>.12</td>
<td>.13</td>
<td>-.28**</td>
<td>-.21*</td>
<td>.15</td>
</tr>
<tr>
<td>RX-LP4321</td>
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<td>-.12</td>
<td>-.16</td>
<td>.11</td>
<td>-.17</td>
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<td>-.07</td>
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<td>.05</td>
<td>-.02</td>
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<tr>
<td>RX-LP5209</td>
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<td>.03</td>
<td>.06</td>
<td>-.08</td>
</tr>
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<tr>
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<td>-.10</td>
<td>.01</td>
<td>-.12</td>
<td>-.08</td>
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</table>

*Correlation is significant at p ≤ .05.

**Correlation is significant at p ≤ .01**
<table>
<thead>
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<th>Antibiotic</th>
<th>RXUSE</th>
<th>RXSE</th>
<th>GENDER</th>
<th>AGE</th>
<th>TOTCDQ</th>
<th>SES</th>
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<td>-.05</td>
<td>-.02</td>
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<td>-.02</td>
<td>-.09</td>
<td>.16</td>
<td>-.06</td>
<td>.02</td>
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<td>-.09</td>
<td>.26*</td>
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</tr>
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<td>.00</td>
<td>.09</td>
<td>.04</td>
<td>.11</td>
</tr>
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<td>RX-LP3742</td>
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<td>-.10</td>
<td>.26*</td>
<td>-.08</td>
<td>.13</td>
</tr>
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<td>.07</td>
<td>-.17</td>
<td>-.19</td>
<td>.10</td>
<td>.24*</td>
</tr>
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<td>-.32**</td>
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<td>.24*</td>
<td>-.08</td>
<td>-.14</td>
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<td>RX-KL4609</td>
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<td>-.11</td>
</tr>
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<td>.03</td>
<td>-.04</td>
<td>.08</td>
</tr>
<tr>
<td>RX-LP5209</td>
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<td>-.04</td>
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<td>.00</td>
<td>.02</td>
</tr>
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<td>RX-LM5127</td>
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<td>-.06</td>
<td>.15</td>
<td>-.02</td>
<td>-.24*</td>
</tr>
<tr>
<td>RX-ML5321</td>
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<td>-.06</td>
<td>-.13</td>
<td>-.07</td>
<td>-.12</td>
<td>-.04</td>
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</table>

* Correlation is significant at p ≤ .05.

** Correlation is significant at p ≤ .01.
TABLE 15
SPEARMAN RANK ORDER CORRELATIONS OF ANTIBIOTIC PREFERENCE AND SELECTED CONTROL VARIABLES FOR SAMPLE E2

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>RXUSE</th>
<th>RXSE</th>
<th>GENDER</th>
<th>AGE</th>
<th>TOTCDQ</th>
<th>SES</th>
</tr>
</thead>
<tbody>
<tr>
<td>RX-LK2307</td>
<td>0.04</td>
<td>-0.17</td>
<td>0.28**</td>
<td>0.02</td>
<td>-0.21*</td>
<td>-0.08</td>
</tr>
<tr>
<td>RX-KP2935</td>
<td>-0.05</td>
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<td>0.02</td>
<td>-0.23*</td>
<td>0.00</td>
</tr>
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<td>RX-LM3107</td>
<td>-0.26*</td>
<td>0.00</td>
<td>-0.25*</td>
<td>-0.01</td>
<td>0.04</td>
<td>-0.01</td>
</tr>
<tr>
<td>RX-LN3722</td>
<td>-0.07</td>
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<td>-0.01</td>
<td>0.14</td>
<td>-0.25*</td>
<td>0.11</td>
</tr>
<tr>
<td>RX-LP3742</td>
<td>0.04</td>
<td>-0.22*</td>
<td>-0.11</td>
<td>-0.08</td>
<td>-0.06</td>
<td>-0.04</td>
</tr>
<tr>
<td>RX-NL3855</td>
<td>-0.10</td>
<td>-0.04</td>
<td>-0.05</td>
<td>0.12</td>
<td>-0.14</td>
<td>-0.02</td>
</tr>
<tr>
<td>RX-LP4321</td>
<td>-0.08</td>
<td>-0.12</td>
<td>-0.17</td>
<td>-0.13</td>
<td>-0.02</td>
<td>-0.10</td>
</tr>
<tr>
<td>RX-KL4609</td>
<td>-0.03</td>
<td>0.15</td>
<td>-0.07</td>
<td>0.11</td>
<td>0.14</td>
<td>-0.18</td>
</tr>
<tr>
<td>RX-KM4678</td>
<td>-0.02</td>
<td>-0.05</td>
<td>0.06</td>
<td>0.03</td>
<td>-0.04</td>
<td>0.14</td>
</tr>
<tr>
<td>RX-LP5209</td>
<td>-0.02</td>
<td>-0.04</td>
<td>-0.21*</td>
<td>-0.06</td>
<td>0.01</td>
<td>-0.22*</td>
</tr>
<tr>
<td>RX-LM5127</td>
<td>0.02</td>
<td>-0.15</td>
<td>-0.13</td>
<td>-0.04</td>
<td>-0.15</td>
<td>-0.11</td>
</tr>
<tr>
<td>RX-ML5321</td>
<td>-0.27*</td>
<td>-0.03</td>
<td>-0.09</td>
<td>-0.03</td>
<td>-0.03</td>
<td>-0.08</td>
</tr>
</tbody>
</table>

* Correlation is significant at p ≤ .05.

** Correlation is significant at p ≤ .01.
The sixth hypothesis advanced the supposition that antibiotic preference is a function of the respondent's general risk taking propensity, as measured by the Choice Dilemmas Questionnaire. In all, $H_6$ was supported in only four cases (see TOTCDQ in Tables 13 and 15). Further, the relationships which proved significant were of moderate intensity, were highly sub-sample related and were not consistent across specific antibiotics. Hence $H_6$ was rejected.

In ten instances, and across three sub-samples (see Tables 12, 13, and 15), gender proved to be statistically related to specific antibiotic preference. In addition, the relationships were heavily localized in one sub-sample (see Table 12). Moreover, the direction of the relationships was inconsistent within drugs (see RX-LK2307 and RX-LM5127). Finally, controlling for specific gender yielded no insight into the vague results of the primary analysis. In view of such findings, $H_7$ was rejected.

It was argued that age would not be related to antibiotic preference. As before, the results of the analysis of $H_8$ were confounded by inconsistencies in the support for the hypothesis, and by sub-sample anomalies (see AGE in Tables 12 through 15). Although age was not related to preference in forty of the forty-eight cases, the number of significant relationships and their magnitude in several cases (see Table 13) clouded the assessment of $H_8$. Overall, however, $H_8$ was supported for the same reasons as the two
previous hypotheses were rejected.

The clearest results were obtained in the examination of the ninth hypothesis, which proposed that SES is unrelated to antibiotic preference. In only three cases, which were not consistent across either sub-samples or antibiotics, was $H_9$ not supported (see Tables 14 and 15). Therefore, $H_9$, in view of the substantial results, was accepted as tenable.

The final two hypotheses argued that antibiotic preference would not be related to previous prescription drug use but would be related to previous side effect experience, $H_{10}$ and $H_{11}$, respectively. Examination of the four tables indicated that $H_{10}$ was supported forty-five times, with three significant relationships being recorded over three drugs in two sub-samples (see Tables 13 and 15). The significant relationships were seemingly stronger than those recorded for the age relationship but again an inconsistent pattern appeared. Hence, it was concluded that $H_{10}$ could be supported.

The exact relationship between previous experience with side effects and preference remains in doubt. Although statistical support was recorded in only six cases out of forty-eight, the distribution of such relationships were spread across all four sub-samples. On the other hand, the significant relationships were not consistent across the antibiotics.
Following the completion of the examination of the formal research hypotheses, efforts were made to reassess the data from alternative viewpoints. In turn, each of the participant characteristics encompassed in the last six hypotheses were controlled so that the remaining variables could be realigned against the individual antibiotic preferences. Such efforts produced no insight into the observations recorded in the primary analysis.

Although the Choice Dilemmas Questionnaire measure proved disappointing as a predictor of antibiotic preference, the measure with one exception, was significantly related to both age and socioeconomic status across all sub-samples. The total risk propensity measure did not achieve significance with either age or SES in sub-sample C2. In the other sub-samples, however, risk taking propensity increased with increasing SES but declined with increasing age, thus reaffirming earlier experience with the measure.

SUMMARY OF FINDINGS

Overall, the homogeneity of the four sub-samples was considered adequate, especially for the values critical for hypothesis testing. Antibiotics tended to be products which were considered important, purchased and used infrequently, and provided interest for the respondents when viewed against the background of the four remaining products. The experimental treatment did not produce a significant change
in preference for many of the decisions, and the preponderance of change was recorded between the C2 and E2 groups. Therefore, although H1 remains in doubt, it was felt that the few but strong findings justified withholding judgment (see Figure 6).

The second hypothesis also remains in doubt, for similar reasons. The number of significant relationships was relatively small, but the magnitude of the significant relationships was considerable (see Figure 6).

The Coleman multivariate analysis resulted in whole-sale acceptance of the third, fourth, and fifth hypotheses (see Figure 6). It was found that side effects produced the majority of effect, while usage restrictions accounted for more variance than did drug age. Finally, price accounted for approximately one-fifth of the variance. In terms of model additivity, it was found that substantial interaction was evident but unidentified in explaining observed preference variance.

It was concluded that general risk propensity, gender, age, socioeconomic status, and general prescription drug experience did not explain antibiotic preference. It must be pointed out, however, that the general prescription drug experience measure was by no means a fine discrimination of such an attribute. Subsequent efforts to refine the measure may reverse the evolutionary findings of the present inquiry. Finally judgment was withheld on the matter of the impact
of general side effect experience on antibiotic preference, but the results may be characterized as especially weak in terms of support for $H_{11}$.

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>$H_1$ A persuasive intervention, i.e., an indication of the relative benefits to be expected with various antibiotics, produces a significant shift in preference for various antibiotics.</td>
<td>In doubt</td>
</tr>
<tr>
<td>$H_2$ Preference for the various antibiotics is significantly different when the respondent makes preference choices on behalf of another person.</td>
<td>In doubt</td>
</tr>
<tr>
<td>$H_3$ Preference for individual antibiotics is related to the relative extent of market experience.</td>
<td>Supported</td>
</tr>
<tr>
<td>$H_4$ Preference for individual antibiotics is inversely related to the relative price of the antibiotic.</td>
<td>Supported</td>
</tr>
<tr>
<td>$H_5$ Preference for individual antibiotics is inversely related to the relative severity of the side effect of the antibiotic.</td>
<td>Supported</td>
</tr>
</tbody>
</table>

**Figure 6**

Summary of Primary Study Conclusion
CHAPTER VI

DISCUSSION AND CONCLUSIONS

The major thrust of the foregoing inquiry was to examine risk perception within the framework of health decision-making. In doing so, participants were randomly assigned to either control or treatment groups and were asked to make decisions within one of four simulated decision environments. Behavioral intent, as measured by the recording of preference for the individual antibiotics, was defined as the operational measure of risk resolution.

The findings resulting from the experimental phase of the study were mixed. From a purely methodological point of view, several conclusions were possible. First, the Q-sort procedure was interpreted as highly successful and deserving of further consideration for alternative application. The procedure allows for a multidimensional approach to research concerning consumer behavior, and appears to represent a means of assessing respondent reactions to complex situations. In addition, the Q-sort technique is highly flexible in terms of its possible application, and allows for rapid measurement of many variables.

The methods developed to aid the implementation of
the post-test only with control group design appear to indicate that experimental research is feasible in the field. In fact, the use of a strict pretest to assure inter-group homogeneity might very well have confounded the results of the present effort. This situation could have arisen if the respondents had entered post-test sessions with differential levels of knowledge about prescription antibiotics as a result of interim learning.

The results of the parallel Q-sort designs failed to substantially support the primary research hypotheses. One interpretation which appeared tenable is that the treatments themselves were below the respondents' perceptual thresholds. Relatedly, respondents may have simply failed to grasp the significance of the persuasive intervention in the decision-making.

The explanation which appeared most engaging, however, derived from the selective effects of the intervention within each C-E comparison. More specifically, it was felt that the selective treatment effects represented the fact that the respondents accepted the persuasive intervention when dealing with some antibiotics but ignored it when considering other drugs. Hence, respondents discriminated between absolute reliance upon the persuasive message while completely ignoring it to solve the decisions at hand. Table 8 adds credence to such an interpretation in that those preference increases which proved significant were for the drugs with
less market experience, while the significant decrease in preference was for an older drug.

The general failure of the treatment to produce significant effects upon preference choices over the entire spectrum of antibiotics may have also resulted from the relative explanatory effect of market experience versus the magnitude of the effect of negative drug reaction. Therefore, had the intervention included a major statement dealing with possibly the relative probability or magnitude of the side effects, the results may have been entirely different.

The greater number of significant swings in preference in the \( C_2 - E_2 \) comparison as opposed to the \( C_1 - E_1 \) comparison may have resulted from the respondent's increased willingness to accept advice in the particular decision matrix. Such an explanation assumes that the decision environment of the young child was perceived as different, or even more risky, than the self-use decision environment.

Without additional investigation, the various explanations remain speculative. However, each appears to have some intuitive appeal, and can not be viewed as mutually exclusive explanations.

In assessing the meaning of the results between the "self" and "other" decision groups, analogous interpretations were also possible. For instance, the significant changes in preference between \( C_1 \) and \( C_2 \) were in the expected
direction. This pattern supports the argument that risk taking declines when a respondent decides for another. In addition, the majority of all twelve comparisons were in the expected direction of preference change.

The seeming lack of significant differences between $E_1$ and $E_2$ groups may have resulted from an implicit assumption error, i.e., the experimental intervention would be interpreted identically in both decision environments. If, in fact, the persuasive message had a different effect on respondents in the $E_1$ versus the $E_2$ group, the results posted in the left and right columns of Table 9 may not be random artifacts but may represent a confounding resulting from differential interpretations of the treatment. Hence, $H_2$ may be valid.

Finally, the differential results between the left and right columns of Table 9 may be interpreted as spurious results of a third or possible fourth variable as yet unidentified. In any event, it was felt that further study was required before drawing any final conclusions about the results.

The within-sample analysis of the drug attributes' effects on preference appeared to reconcile with the idea of selective acceptance of the persuasive intervention. From Table 11 there emerged a picture of the participants' decision processes that indicated: (1) preference was based upon multivariate decision-making where several cues were
incorporated in the decision process, (2) the relative effects of the individual attributes were not equal; drug side effect, a proxy for possible negative consequences, produced the strongest explanation of the variance, and (3) respondents appeared to weigh alternatives in four dimensions but individual cue weights were determined relative to other cues as evidenced by the existence of interaction effects (see Table 11). If such results and explanations are valid, the process of consumer decision-making may remain vague until wholesale efforts are made to research the question from a multivariate paradigm. However, the present study should not be generalized without due respect for the nature of the sampling frame, the parochial extent of the products tested, and the fact that antibiotic decisions are typically outside the direct control of most consumers. In addition, the failure of the several respondent characteristics to statistically relate to preference choices should not be taken as final proof that consumer decision-making is independent of the particulars of the consumer per se.

The present investigation was consumated to investigate both perceived risk and consumer decision-making with the eventual goal of adding insight into the behavior of consumers when involved in medical therapy. Knowledge of factors that could unduly frighten a patient may prove useful to medical practitioners in attempting to avoid such therapy whenever possible without jeopardizing rational medical
treatment. On the other hand, if perceived risk can produce or aggravate existing pathologies, the medical practitioner would seemingly benefit from an identification and measurement of such perceptions. Efforts could be directed toward either helping to allay or calm undue fear on the part of the patient, or toward minimizing the use of medical practices which represent perceptual risk to the patient.

Finally, the study of drug preferences from the view of risk perception appeared to hold special significance in the case of prescribed medications. In the typical case, a patient receives a prescription order from a physician and that order is dispensed by a pharmacist. Often patients begin, continue, and cease drug therapy in an environment which is physically and temporally removed from either medical practitioner.

If prescription drugs are perceived as risky by the consumer, the nature of any explanation tendered or not tendered by either the physician or pharmacist may possibly impart risk perception to the drug-taking event. Moreover, if the two professional experts were to provide contradictory information, or if that information, although consistent, was perceived to be contradictory, it would seem the patient would likely suffer unnecessarily from possible perceptual dissonance created by the medical practitioners themselves.
Therefore, to the extent that perceived risk is a viable concept in explaining patient response, any efforts to identify and measure such perceptions would provide benefits to both patient and practitioner alike. Efforts to coordinate therapy techniques and communications to patients would seemingly improve medical care to the patient’s ultimate benefit. Moreover, the major conclusion from the present effort, that patients appear to both perceive and react to risks associated with at least one type of prescription drug, should be interpreted as a beginning effort in explaining consumer behavior. Thus, the present findings have only begun to uncover what may very well be an extremely complex phenomenon. Other investigations are required to further develop the concepts involved before such knowledge can be efficiently applied to benefit future patients.
APPENDIX A

CONSENT FORM
CONSENT TO PARTICIPATE AS A SUBJECT IN RESEARCH

I consent to participate as a subject in the research investigation entitled: ________________________________________________________.

The nature and general purpose of the experimental procedure have been explained to me by _____________________________. He is authorized to proceed on the understanding that I may terminate my participation as a subject in this research at any time I so desire.

I understand that my identity will not be revealed in any publication or document resulting from this research.

I understand that any additional questions relating to this research may be directed to the chairman of the Human Subjects Review Committee, ____________________________, College of Pharmacy, 422-2266.

Signed ____________________________

Date ____________________________
APPENDIX B

GENERAL INFORMATION QUESTIONNAIRE
GENERAL INFORMATION QUESTIONNAIRE

All information from this study will be kept anonymous, and your exact identity should not be indicated on any of the questionnaires. However, in order that we might have some idea of the characteristics of the volunteer respondents, we ask that you fill in the appropriate blanks below by checking the answers that most closely describe you.

IF FOR ANY REASON, you feel uncomfortable about providing such information, simply cross out the entire question and leave it blank.

If during the time you are filling out the questionnaires, you have a question, feel free to ask the interviewer.

We would like to thank you in advance for helping with this study. If you would like to receive a summary of the results, call Mr. Bruce R. Siecker at 422-2038. If you think that you might like to participate in other studies that might develop, the same person should be contacted at the above number.

*********

INDICATE ANSWER BY CHECKING OR CIRCLING:

<table>
<thead>
<tr>
<th>(1) Gender:</th>
<th>_____Female</th>
<th>_____Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>(2) Your Age in Years (last birthday)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>_____ 20 to 24</td>
<td>_____ 45 to 49</td>
<td></td>
</tr>
<tr>
<td>_____ 25 to 29</td>
<td>_____ 50 to 54</td>
<td></td>
</tr>
<tr>
<td>_____ 30 to 34</td>
<td>_____ 55 to 59</td>
<td></td>
</tr>
<tr>
<td>_____ 35 to 39</td>
<td>_____ 60 to 64</td>
<td></td>
</tr>
<tr>
<td>_____ 40 to 44</td>
<td>_____ 65 and above</td>
<td></td>
</tr>
</tbody>
</table>
(3) Education of the female head of the household. Indicate the last full year of school completed. (If male and unmarried, indicate your last year of school completed.)

<table>
<thead>
<tr>
<th>Elementary School</th>
<th>High School</th>
<th>College or Trade School</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than ______ 6 years</td>
<td>______ Freshman year</td>
<td>______ 1 year</td>
</tr>
<tr>
<td>______ 6 years</td>
<td>______ Sophomore year</td>
<td>______ 2 years</td>
</tr>
<tr>
<td>______ 7 years</td>
<td>______ Junior year</td>
<td>______ 3 years</td>
</tr>
<tr>
<td>______ 8 years</td>
<td>______ Senior year</td>
<td>______ 4 years</td>
</tr>
<tr>
<td>______ 5 years</td>
<td></td>
<td>______ and above</td>
</tr>
</tbody>
</table>

(4) Occupation of the main wage or salary earner of the household. If the occupation does not have a title or common name, describe what the job includes. If presently unemployed, describe the work the main wage or salary earner normally does. Please explain.

(5) Indicate the approximate annual family gross earned income before taxes. Please check only one.

<table>
<thead>
<tr>
<th>Less than $1,000</th>
<th>$3,500 - 3,999</th>
<th>$9,000 - 9,999</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1,000 - 1,499</td>
<td>$4,000 - 4,999</td>
<td>$10,000 - 11,999</td>
</tr>
<tr>
<td>$1,500 - 1,999</td>
<td>$5,000 - 5,999</td>
<td>$12,000 - 14,999</td>
</tr>
<tr>
<td>$2,000 - 2,499</td>
<td>$6,000 - 6,999</td>
<td>$15,000 - 24,999</td>
</tr>
<tr>
<td>$2,500 - 2,999</td>
<td>$7,000 - 7,999</td>
<td>$25,000 - 49,999</td>
</tr>
<tr>
<td>$3,000 - 3,499</td>
<td>$8,000 - 8,999</td>
<td>$50,000 or more</td>
</tr>
</tbody>
</table>
PREFERENCE-EXPERIENCE QUESTIONNAIRE

We are interested in learning something about your feelings and experiences with five different products. Below you will find several questions concerning your personal thoughts and experiences. Read each set of directions carefully. If you have any questions, feel free to ask the interviewer.

********

(1) Some products are more interesting to people than are others. Below you will find several pairs of products. For each pair we would like you to circle or underline the product that is more interesting to you.

INDICATE WHICH ONE OF EACH PAIR IS MORE INTERESTING TO YOU:

(A) Underarm Deodorant or Facial Tissue
(B) Headache Remedy or Antibiotic
(C) Bread or Antibiotic
(D) Facial Tissue or Headache Remedy
(E) Underarm Deodorant or Bread
(F) Headache Remedy or Underarm Deodorant
(G) Bread or Facial Tissue
(H) Antibiotic or Underarm Deodorant
(I) Headache Remedy or Bread
(J) Facial Tissue or Antibiotic
Situations may vary in their importance to a person making the decision. If you were faced with making a decision about each one of the five different products below, how important would that decision be for you? In each case, circle or mark the number that most closely agrees with how important the decision would be for you.

(A) Deciding on which brand of Bread to buy: (Mark one)

   VERY IMPORTANT
   7 6 5 4 3 2 1

(B) Deciding on which brand of Antibiotic to accept: (Mark one)

   VERY IMPORTANT
   7 6 5 4 3 2 1

(C) Deciding on which brand of Headache Remedy to buy: (Mark one)

   VERY IMPORTANT
   7 6 5 4 3 2 1

(D) Deciding on which brand of Underarm Deodorant to buy: (Mark one)

   VERY IMPORTANT
   7 6 5 4 3 2 1

(E) Deciding on which brand of Facial Tissue to buy: (Mark one)

   VERY IMPORTANT
   7 6 5 4 3 2 1
(3) Some products are purchased more frequently than others. Below you will find each of the five products together with several time periods of purchase. For each product, we would like you to indicate which time period most closely agrees with how often you have purchased the product in the last year.

(A) Bread: (Mark one)

- _____ daily 
- _____ every 2-3 days 
- _____ weekly 
- _____ every 2 weeks 
- _____ monthly 
- _____ have never purchased

(B) Antibiotic: (Mark one)

- _____ daily 
- _____ every 2-3 days 
- _____ weekly 
- _____ every 2 weeks 
- _____ monthly 
- _____ have never purchased

(C) Facial Tissue: (Mark one)

- _____ daily 
- _____ every 2-3 days 
- _____ weekly 
- _____ every 2 weeks 
- _____ monthly 
- _____ have never purchased
(D) Underarm Deodorant: (Mark one)

___ daily
___ every 2-3 days
___ weekly
___ every 2 weeks
___ monthly

___ every 2-3 months
___ every 6 months
___ once a year
___ less than once a year
___ have never purchased

(E) Headache Remedy: (Mark one)

___ daily
___ every 2-3 days
___ weekly
___ every 2 weeks
___ monthly

___ every 2-3 months
___ every 6 months
___ once a year
___ less than once a year
___ have never purchased
Below you will find the five products together with several patterns of use. For each product, we would like you to indicate which time period most closely agrees with how often you have used, eaten, or taken the product in the past year.

<table>
<thead>
<tr>
<th>Product</th>
<th>(Mark one)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>(A) Antibiotic</strong></td>
<td></td>
</tr>
<tr>
<td>_____ more than once a day</td>
<td>_____ monthly</td>
</tr>
<tr>
<td>_____ daily</td>
<td>_____ every 2-3 months</td>
</tr>
<tr>
<td>_____ every 2-3 days</td>
<td>_____ every 6 months</td>
</tr>
<tr>
<td>_____ weekly</td>
<td>_____ once in a year</td>
</tr>
<tr>
<td>_____ every 2 weeks</td>
<td>_____ did not use</td>
</tr>
<tr>
<td><strong>(B) Facial Tissue</strong></td>
<td></td>
</tr>
<tr>
<td>_____ more than once a day</td>
<td>_____ monthly</td>
</tr>
<tr>
<td>_____ daily</td>
<td>_____ every 2-3 months</td>
</tr>
<tr>
<td>_____ every 2-3 days</td>
<td>_____ every 6 months</td>
</tr>
<tr>
<td>_____ weekly</td>
<td>_____ once in a year</td>
</tr>
<tr>
<td>_____ every 2 weeks</td>
<td>_____ did not use</td>
</tr>
<tr>
<td><strong>(C) Underarm Deodorant</strong></td>
<td></td>
</tr>
<tr>
<td>_____ more than once a day</td>
<td>_____ monthly</td>
</tr>
<tr>
<td>_____ daily</td>
<td>_____ every 2-3 months</td>
</tr>
<tr>
<td>_____ every 2-3 days</td>
<td>_____ every 6 months</td>
</tr>
<tr>
<td>_____ weekly</td>
<td>_____ once in a year</td>
</tr>
<tr>
<td>_____ every 2 weeks</td>
<td>_____ did not use</td>
</tr>
<tr>
<td><strong>(D) Bread</strong></td>
<td></td>
</tr>
<tr>
<td>_____ more than once a day</td>
<td>_____ monthly</td>
</tr>
<tr>
<td>_____ daily</td>
<td>_____ every 2-3 months</td>
</tr>
<tr>
<td>_____ every 2-3 days</td>
<td>_____ every 6 months</td>
</tr>
<tr>
<td>_____ weekly</td>
<td>_____ once in a year</td>
</tr>
<tr>
<td>_____ every 2 weeks</td>
<td>_____ did not use</td>
</tr>
<tr>
<td><strong>(E) Headache Remedy</strong></td>
<td></td>
</tr>
<tr>
<td>_____ more than once a day</td>
<td>_____ monthly</td>
</tr>
<tr>
<td>_____ daily</td>
<td>_____ every 2-3 months</td>
</tr>
<tr>
<td>_____ every 2-3 days</td>
<td>_____ every 6 months</td>
</tr>
<tr>
<td>_____ weekly</td>
<td>_____ once in a year</td>
</tr>
<tr>
<td>_____ every 2 weeks</td>
<td>_____ did not use</td>
</tr>
</tbody>
</table>
Over a period of time many people may receive many different prescriptions ordered by their doctors. Also, many people experience side effects (undesired symptoms from the drug). We are interested in learning about your experiences with side effects. Below is a list of the major types of drugs ordered by American doctors. We would like you to examine each drug type and then indicate with an "X" whether you "Have Taken," "Have Not Taken," or "Can Not Recall" having taken such drugs on orders from your doctor. In addition, we would like you to indicate with an "X" in the last column any experience you have had with noticeable side effects from such medication.

<table>
<thead>
<tr>
<th>CHECK ONE</th>
<th>HAVE TAKEN</th>
<th>HAVE NOT TAKEN</th>
<th>CAN NOT RECALL</th>
<th>HAD SIDE EFFECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antibiotics</td>
<td>___</td>
<td>___</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Tranquilizers</td>
<td>___</td>
<td>___</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Cough Syrups</td>
<td>___</td>
<td>___</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Blood Thinners</td>
<td>___</td>
<td>___</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Heart Drugs</td>
<td>___</td>
<td>___</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Birth Control Pills</td>
<td>___</td>
<td>___</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Hormones</td>
<td>___</td>
<td>___</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Penicillin</td>
<td>___</td>
<td>___</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Pain Relievers</td>
<td>___</td>
<td>___</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Drugs to Reduce Blood Sugar</td>
<td>___</td>
<td>___</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Drugs to Reduce Blood Pressure</td>
<td>___</td>
<td>___</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Water Pills (Diuretics)</td>
<td>___</td>
<td>___</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Drugs for Arthritis</td>
<td>___</td>
<td>___</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Weight Reducing Drugs</td>
<td>___</td>
<td>___</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Valium®</td>
<td>___</td>
<td>___</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Librium®</td>
<td>___</td>
<td>___</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Darvon®</td>
<td>___</td>
<td>___</td>
<td>___</td>
<td>___</td>
</tr>
</tbody>
</table>
APPENDIX D

CHOICE DILEMMAS QUESTIONNAIRE

187
CHOICE DILEMMAS QUESTIONNAIRE

We are interested in learning something about how you would advise other people about their problems. Below you will find six (6) different people, each with a particular decision to make. We would like you to carefully consider each of the six decisions. Assume you have been approached by each person with his problem and been asked for advice. In each case the more risky course of action is preferred by the person you are advising. Indicate, by checking one line, the lowest possibility of success you would demand before recommending that the person take the riskier course of action in each case. It will be helpful to read all the situations carefully before beginning. If you have any questions, feel free to ask the interviewer.

******

(1) Mr. A, who is married and has several children, has been working at his present job for five years. He is assured of a lifetime with a modest, though adequate salary, and pension benefits upon retirement. On the other hand, it is very unlikely that his salary will increase much before he retires. Recently, Mr. A has been offered a job with a small, newly founded company with a highly uncertain future. The new job would pay more to start and would offer the possibility of a large annual bonus if the company survived the competition of the larger firms.

My advice is that Mr. A should take the new job if the chance of success is- (Circle or check one)

_____ 1 chance in 10  _____ 7 chances in 10
_____ 3 chances in 10  _____ 9 chances in 10
_____ 5 chances in 10  _____ should not accept under any conditions.
(2) Medical tests show that Mr. E, who is the father of a young family, has a severe heart ailment. He must seriously curtail his customary way of life. If Mr. E would undergo a delicate medical operation, there is a chance that his heart ailment could be corrected. However, this operation might cure him completely or might prove fatal.

Mr. E should have the operation if the chance of success is— (Circle or check one)

- 1 chance in 10
- 3 chances in 10
- 5 chances in 10

(3) In a match between two traditional rival football teams, only a few seconds are left to be played in the game. Mr. G, the captain of one team, sees two possibilities: one is a play that is almost certain to tie the score, and another one is a more risky play that would produce sure victory, if successful. At the same time, if the more risky play should fail, defeat would almost certainly follow.

The captain should play for the win if the chance of success is— (Circle or mark one)

- 1 chance in 10
- 3 chances in 10
- 5 chances in 10

(4) Upon completing a job-training program, Mr. H has been notified that he must choose between two jobs. As he describes them to his wife and older children, it becomes apparent that one job offers little prestige and status, but it would guarantee regular employment. The other job offers more prestige and status, but because of very demanding standards only a fraction of the people receive permanent employment.

Mr. H should take the second job if the chance of success is— (Circle or mark one)

- 1 chance in 10
- 3 chances in 10
- 5 chances in 10

should not accept under any conditions.
(5) Mr. N. has a strong feeling of responsibility toward his community. He must decide whether or not to run for public office on the ticket of a minority party whose campaign funds are very limited. It will require an intensive campaign which means that Mr. N must sacrifice a good deal of his own time and money. Mr. N's wife and children will also be required to take part in campaign activities.

Mr. N should run on the minority party ticket if the chance of success is— (Circle or check one)

| Chance in 10 | 1 chance in 10 | 2 chances in 10 | 3 chances in 10 | 4 chances in 10 | 5 chances in 10 | 6 chances in 10 | 7 chances in 10 | 8 chances in 10 | 9 chances in 10 | should not accept under any conditions |

(6) Mr. S and his family have recently moved here from another state, in order to be closer to his wife's parents. Upon finding a new job, he must choose between two openings. One involves working on a series of easy short-term projects with only a moderate chance of getting ahead. The other is a more important long-term project with much more opportunity to get ahead, if his work proves successful. Since this long-term project is relatively difficult, Mr. S would have to take the chance of having nothing to show for his effort.

Mr. S should take the second job if the chance of success is— (Circle or check one)

| Chance in 10 | 1 chance in 10 | 2 chances in 10 | 3 chances in 10 | 4 chances in 10 | 5 chances in 10 | 6 chances in 10 | 7 chances in 10 | 8 chances in 10 | 9 chances in 10 | should not accept under any conditions |
APPENDIX E

ANTIBIOTIC PREFERENCE FOR SUB-SAMPLE C₁
In most cases, patients have little say about which drugs will be prescribed for a particular ailment. We are interested in learning something about which drugs you would prefer to take, if given the opportunity.

Attached to this form are twelve slips, each describing a different antibiotic available today. Assume that you have just seen a doctor from the Ohio State University clinic. Your finger infection requires an antibiotic from the hospital pharmacy. We would like you to arrange the twelve antibiotic drug slips into seven piles according to your preference for each. Specific directions follow below. If you have any questions, feel free to ask the interviewer.

************

DIRECTIONS

(1) **DO NOT** indicate your name or any other identifying marks on this form.

(2) Examine the attached slips. Be sure there are twelve different antibiotics described. (If not please notify the interviewer.)

(3) Arrange the twelve slips into **seven** piles according to the descriptions below:

<table>
<thead>
<tr>
<th>PILES</th>
<th>&quot;A&quot;</th>
<th>&quot;B&quot;</th>
<th>&quot;C&quot;</th>
<th>&quot;D&quot;</th>
<th>&quot;E&quot;</th>
<th>&quot;F&quot;</th>
<th>&quot;G&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOST</td>
<td>PREFERRED</td>
<td>LEAST</td>
<td>PREFERRED</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(4) The only requirement is that you end up with seven piles when you are finished.

(5) When you have completed arranging the twelve antibiotics into seven piles, mark the corresponding pile letter clearly on the face of each antibiotic slip.

(6) When finished, attach the twelve slips to this form and return it to the interviewer.

Thank you for your patience and cooperation in completing this form.

Form DK1-APA
ANTIBIOTIC-#LM3407; released recently by the U.S. Food and Drug Administration for experimental use; average price is $8.85; may cause skin rash.

ANTIBIOTIC-#LP4321; released recently by the U.S. Food and Drug Administration for experimental use; average price is $8.85; may cause stomach ulcers.

ANTIBIOTIC-#ML5321; released recently by the U.S. Food and Drug Administration for experimental use; average price is $2.95; may cause skin rash.

ANTIBIOTIC-#LP3742; released recently by the U.S. Food and Drug Administration for experimental use; average price is $2.95; may cause stomach ulcers.

ANTIBIOTIC-#KL4609; released recently by the U.S. Food and Drug Administration for general use; average price is $8.85; may cause skin rash.

ANTIBIOTIC-#LK2307; released recently by the U.S. Food and Drug Administration for general use; average price is $8.85; may cause stomach ulcers.

ANTIBIOTIC-#NL3855; released recently by the U.S. Food and Drug Administration for general use; average price is $2.95; may cause skin rash.

ANTIBIOTIC-#LN3722; released recently by the U.S. Food and Drug Administration for general use; average price is $2.95; may cause stomach ulcers.

ANTIBIOTIC-#LP5209; released ten years ago by the U.S. Food and Drug Administration for general use; average price is $8.85; may cause skin rash.

ANTIBIOTIC-#LM5127; released ten years ago by the U.S. Food and Drug Administration for general use; average price is $8.85; may cause stomach ulcers.

ANTIBIOTIC-#KM4678; released ten years ago by the U.S. Food and Drug Administration for general use; average price is $2.95; may cause skin rash.

ANTIBIOTIC-#KP2935; released ten years ago by the U.S. Food and Drug Administration for general use; average price is $2.95; may cause stomach ulcers.
APPENDIX F

ANTIBIOTIC PREFERENCE FOR SUB-SAMPLE E₁
ANTIBIOTIC PREFERENCE

In most cases, patients have little say about which drugs will be prescribed for a particular ailment. We are interested in learning something about which drugs you would prefer to take, if given the opportunity.

Attached to this form are twelve slips, each describing a different antibiotic available today. Assume that you have just seen a doctor from the Ohio State University clinic. Your finger infection requires an antibiotic from the hospital pharmacy. We would like you to arrange the twelve antibiotic drug slips into seven piles according to your preference for each. Specific directions follow below. If you have any questions, feel free to ask the interviewer.

*********

DIRECTIONS

(1) Do not indicate your name or any other identifying marks on this form.

(2) Examine the attached slips. Be sure there are twelve different antibiotics described. (If not please notify the interviewer.)

(3) Arrange the twelve slips into seven piles according to the descriptions below:

<table>
<thead>
<tr>
<th>PILES</th>
<th>&quot;A&quot;</th>
<th>&quot;B&quot;</th>
<th>&quot;C&quot;</th>
<th>&quot;D&quot;</th>
<th>&quot;E&quot;</th>
<th>&quot;F&quot;</th>
<th>&quot;G&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOST PREFERRED</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>LEAST PREFERRED</td>
</tr>
</tbody>
</table>

(4) The only requirement is that you end up with seven piles when you are finished.

(5) When you have completed arranging the twelve antibiotics into seven piles, mark the corresponding pile letter clearly on the face of each antibiotic slip.

(6) When finished, attach the twelve slips to this form and return it to the interviewer.

Thank you for your patience and cooperation in completing this form.

Form DK1-APA
As consumers, we realize that physicians know much more about drug therapy than do patients. To give you some additional information in making your preference choices, we have reproduced below a short quote from an article written by a professor of medicine at an American medical college. Although the entire article is not important for our purposes, the remainder may be found in the July, 1974 issue of the *Journal of the Midwestern Medical Society*, if you are interested.

**********

and with no further hesitation, I can state that the newer antibiotics offer dramatic advantages over those we used in the late 50's.

In fact, the latest developments are so effective that I do not hesitate to prescribe them for all my patients. Experience has shown me that these newer drugs are dramatically effective in almost any infection. In several cases, I have achieved rapid recovery from serious infections in infants as well as aged patients. In addition, I think that the newer antibiotics are safer in that they act so quickly.

T. Donald Baldwin, M.D.
APPENDIX G

ANTIBIOTIC PREFERENCE FOR SUB-SAMPLE $c_2$
ANTIBIOTIC PREFERENCE

In most cases, patients have little say about which drugs will be prescribed for a particular ailment. We are interested in learning something about which drugs you would choose for a child, if given the opportunity.

Attached to this form are twelve slips, each describing a different antibiotic available today. Assume that you have just taken the neighbors' child, whom you have been watching for the week while the parents are on vacation, to see a doctor from the Ohio State University clinic. The toddler's finger infection requires an antibiotic. We would like you to arrange the twelve antibiotic drug slips into seven piles according to your preference in choosing for the neighbors' child. Specific directions follow below. If you have any questions, feel free to ask the interviewer.

*********

DIRECTIONS

(1) DO NOT indicate your name or any other identifying marks on this form.

(2) Examine the attached slips. Be sure there are twelve different antibiotics described. (If not please notify the interviewer.)

(3) Arrange the twelve slips into seven piles according to the descriptions below:

<table>
<thead>
<tr>
<th>PILES</th>
<th>&quot;A&quot;</th>
<th>&quot;B&quot;</th>
<th>&quot;C&quot;</th>
<th>&quot;D&quot;</th>
<th>&quot;E&quot;</th>
<th>&quot;F&quot;</th>
<th>&quot;G&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MOST PREFERRED</td>
<td>LEAST PREFERRED</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(4) The only requirement is that you end up with seven piles when you are finished.

(5) When you have completed arranging the twelve antibiotics into seven piles, mark the corresponding pile letter clearly on the face of each antibiotic slip.

(6) When finished, attach the twelve slips to this form and return it to the interviewer.

Thank you for your patience and cooperation in completing this form.
APPENDIX H

ANTIBIOTIC PREFERENCE FOR SUB-SAMPLE $E_2$
ANTIBIOTIC PREFERENCE

In most cases, patients have little say about which drugs will be prescribed for a particular ailment. We are interested in learning something about which drugs you would choose for a child, if given the opportunity.

Attached to this form are twelve slips, each describing a different antibiotic available today. Assume that you have just taken the neighbors' child, whom you have been watching for the week while the parents are on vacation, to see a doctor from the Ohio State University clinic. The toddler's finger infection requires an antibiotic. We would like you to arrange the twelve antibiotic drug slips into seven piles according to your preference in choosing for the neighbors' child. Specific directions follow below. If you have any questions, feel free to ask the interviewer.

**********

DIRECTIONS

(1) DO NOT indicate your name or any other identifying marks on this form.

(2) Examine the attached slips. Be sure there are twelve different antibiotics described. (If not, please notify the interviewer.)

(3) Arrange the twelve slips into seven piles according to the descriptions below:

PILEs       "A"   "B"   "C"   "D"   "E"   "F"   "G"
MOST         PREFERRED    LEAST    PREFERRED

(4) The only requirement is that you end up with seven piles when you are finished.

(5) When you have completed arranging the twelve antibiotics into seven piles, mark the corresponding pile letter clearly on the face of each antibiotic slip.

(6) When finished, attach the twelve slips to this form and return it to the interviewer.

Thank you for your patience and cooperation in completing this form.
As consumers, we realize that physicians know much more about drug therapy than do patients. To give you some additional information in making your preference choices, we have reproduced below a short quote from an article written by a professor of medicine at an American medical college. Although the entire article is not important for our purposes, the remainder may be found in the July, 1974 issue of the Journal of the Midwestern Medical Society, if you are interested.

*********

July 1974 Vol. 9, No. 8

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T. Donald Baldwin, M.D.
APPENDIX I

SPEARMAN RANK ORDER CORRELATIONS OF INTERDRUG PREFERENCE FOR SUB-SAMPLE C₁
<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>(A)</th>
<th>(B)</th>
<th>(C)</th>
<th>(D)</th>
<th>(E)</th>
<th>(F)</th>
<th>(G)</th>
<th>(H)</th>
<th>(I)</th>
<th>(J)</th>
<th>(K)</th>
<th>(L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Old Gen/Rash/$2.95(A)</td>
<td>1.00</td>
<td>.46**</td>
<td>.20*</td>
<td>.21*</td>
<td>-.33**-.03</td>
<td>.31**-.03</td>
<td>-.03</td>
<td>.08</td>
<td>-.06</td>
<td>.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Old Gen/Rash/$8.85(B)</td>
<td>1.00</td>
<td>.46**</td>
<td>.58**</td>
<td>-.22*</td>
<td>.33**</td>
<td>.03</td>
<td>.40**-.11</td>
<td>.15</td>
<td>-.16</td>
<td>.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Old Gen/Ulcer/$2.95(C)</td>
<td>1.00</td>
<td>.70**</td>
<td>-.18</td>
<td>.06</td>
<td>.56**</td>
<td>.29**</td>
<td>.03</td>
<td>-.03</td>
<td>.26*</td>
<td>.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Old Gen/Ulcer/$8.85(D)</td>
<td>1.00</td>
<td>-.17</td>
<td>.28**</td>
<td>.48**</td>
<td>.56**-.18</td>
<td>.02</td>
<td>-.01</td>
<td>.08</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Gen/Rash/$2.95(E)</td>
<td>1.00</td>
<td>.54**</td>
<td>.30**</td>
<td>.08</td>
<td>.30**</td>
<td>.38**</td>
<td>.14</td>
<td>-.07</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Gen/Rash/$8.85(F)</td>
<td>1.00</td>
<td>.31**</td>
<td>.03</td>
<td>.12</td>
<td>.39**</td>
<td>-.10</td>
<td>-.02</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Gen/Ulcer/$2.95(G)</td>
<td>1.00</td>
<td>.59**</td>
<td>.02</td>
<td>.02</td>
<td>.35**</td>
<td>-.19</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Gen/Ulcer/$8.85(H)</td>
<td>1.00</td>
<td>-.15</td>
<td>.09</td>
<td>.03</td>
<td>.26*</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>New Exp/Rash/$2.95(I)</td>
<td>1.00</td>
<td>.67**</td>
<td>.47**</td>
<td>-.09</td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>New Exp/Rash/$8.85(J)</td>
<td>1.00</td>
<td>.16</td>
<td>.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Exp/Ulcer/$2.95(K)</td>
<td>1.00</td>
<td>.29**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Exp/Ulcer/$8.85(L)</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Correlation is significant at $p \leq .05$.
** Correlation is significant at $p \leq .01$.
* Order of drugs is identical to Table 10.
BIBLIOGRAPHY

Books


Periodicals


Unpublished Material
