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**LA THÈSE A ÉTÉ
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A Computer Protocol of Consumers
in a Simulated Search/Purchase Task:
Sequential Patterns of Prepurchase
Information-Seeking for a Durable Good

Nancy Jeanne Church

A Thesis
in
The Department
of
Marketing

Presented in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy at
Concordia University
Montréal, Québec, Canada

October 1986

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ABSTRACT

A Computer Protocol of Consumers
in a Simulated Search/Purchase Task:
Sequential Patterns of Prepurchase
Information Seeking for a Durable Good

Nancy Jeanne Church
Concordia University, 1986

Prepurchase information seeking has been studied extensively by marketing researchers. They have focused on the direction and degree dimensions and, more recently, on the patterns dimension of external search. The patterns reported have simply been different combinations of the direction and degree dimensions of search; they do not reveal the sequence of information source usage, and this knowledge may be useful to consumer marketers.

A computer interactive data collection methodology was developed for this study; it was designed to track the consumer's entire information search for a durable good in a laboratory setting. The information search data were entered into a cluster analytic algorithm, and five sequential search patterns resulted.

The largest search cluster, the One-Source Shoppers, comprised over one-third of the sample with most making only a personal visit to a retail store(s). Other One-Source Shoppers used only newspaper advertising or Consumer Reports magazine before making a purchase decision. The second largest cluster, the Variety Information Seekers, tended to use all three types of information (i.e., commercial,

neutral, and personal sources). Their typical search sequence involved the use of Consumer Reports followed by a retail store visit. The Advice Seekers exhibited two types of search, either using only one source (a catalog or a knowledgeable friend or relative) or more than one source (typically a knowledgeable friend or relative followed by a personal visit to a retail store).

Some consumers rely exclusively on commercially available information, and were labelled the Seller-Provided Information Seekers. Their typical search sequence included the use of newspaper advertising followed by a retail store visit. The smallest search cluster involved the greatest amount of external information seeking. These consumers, the Information Intensive Shoppers, all used Consumer Reports followed by the catalog source. Many then went on to visit to a retail store.

It was also found that consumers' use of their first information source is related to both their perception of the ease of effort in locating a source and the perceived usefulness of a source. Consumers who use a neutral source in their search sequence, such as Consumer Reports, exhibited significantly longer search sequences.

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industrial buying behavior have their similarities, and expect to do research in both areas in the future.

My research was based on a computer simulation, which was programmed by Mr. Kai-Yan Yip. His programming skills are top-notch, and my thanks go to him for many long hours of writing code.

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CHAPTER I

INTRODUCTION

In today's world of an information explosion and information overload, it is important that consumer behaviorists understand how consumers are coping with the mounds of information available to them regarding a purchasing problem. While most consumer behaviorists have included the information search process in their comprehensive models, it is still being represented as a black box. This indicates that there is a lack of thorough understanding about what occurs during the search for information about durable goods and why search occurs.

Consumer Decision Context

Consumer behavior has frequently been studied in a piecemeal fashion, often from the standpoint of either brand or store choice. However, the problem is much larger than that. Many more decisions are involved and intertwined in the information search process. The consumer will have to make decisions about: (a) the general product category, (b) the specific product category, (c) the store, (d) the brand, and (e) the model/features desired. These decisions will not necessarily be made in that order but they must be made, either consciously or by default.

To illustrate the number of decisions that are made in a purchasing situation, an example of a color television purchase is provided. The consumer may first decide that she would prefer to buy a television rather than a microwave

oven (general product category). Next, she decides she wants to buy a color television rather than a black and white set (specific product category). She chooses to buy a SONY brand of color television (brand decision) at the local Kmart (store decision). Finally, she selects the 19-inch portable model with remote control and computer hook-up (model/features decisions).

The number of decisions made by the purchaser of a durable good illustrates the complexity of the durable good purchasing process. It is a larger process within which is contained the information search process. The primary focus of this study will be on the prepurchase information search process for a durable good.

Consumer Search Focus

A large number of studies regarding the consumer's search for durable goods have been conducted. They have focused on three areas of information search: (1) the EXTENT of the external search, (2) the relative IMPORTANCE of external information sources, and (3) general PATTERNS of external information seeking. Hence, we know that some consumers conduct extensive prepurchase searches while others are less thorough in their searches prior to purchasing. We know that some information sources are perceived as being more important and are relied on more heavily in order to make the ultimate purchase decision. We are also aware that some consumers will exhibit different

patterns of source usage, relying on particular sets of information sources to reach a purchase decision.

What is not known about the consumer's external search for durables may be even more important than what is already known. While we may be aware that patterns or sets of information source usage exist, we do not know the ORDER in which the consumer gathers information prior to purchasing. Perhaps a small number of sequential patterns of information source usage exist. If so, then companies may be able to develop distinct marketing strategies to reach and influence consumers who utilize different sequential search patterns.

While it may seem difficult to meaningfully dissociate the consumer's search sequence from the direction and degree of the consumer's search, it is desirable to make it the focal point of a study because so little is known about the search sequence. Search sequence patterns can reveal a great deal of information about the search process. The sequential patterns of source usage can reveal both the direction (i.e., which sources) and the degree (i.e., how many sources and the intensity) of search. However, these dimensions have been investigated numerous times before.

Studies of the sequential patterns of source usage will add a new dimension and new information to the field of marketing. Although search sequence will be the focal point of this research, information about direction and degree of search will logically be gathered simultaneously since

sequence of information source usage naturally succeeds direction and degree of search.

However, it should also be noted that the sequence of source usage is dependent on the quality of the information source and the quality of information received--and these vary from situation to situation and from person to person.

Methodology for Measuring Consumer Search for Durable Goods

Tauber (1982) has called on marketing researchers to develop customized approaches for durable goods research. He claims that many of the measures used for measuring consumer behavior involving non-durable goods are not applicable or appropriate for durable goods. In particular, Tauber (1982) urged researchers to conduct tracking research among consumers of durables that "should be designed to fit or simulate the consumer's purchase-decision process." (p. 10)

A tracking research methodology is desirable when studying durable goods because:

- a. durable goods are often more complex and involve greater and varied risks,
- b. durable goods are purchased infrequently, and
- c. the decision-making process for durable goods is often longer and more complex than for packaged goods.

Hence, the longer prepurchase process and greater lack of knowledge for durable goods makes the use of a tracking

procedure more attractive than an ex post facto methodology or a tracking study of a genuine external search process.

The research reported herein is specifically designed to simulate the consumer's search and decision-making process for a durable good. The simulation includes a variety of commonly-used information sources, which provide information to the prospective consumer on features, models, brands, and stores. Given that the decision-making process usually culminates in decisions regarding all of these variables, the simulation used in this study will more comprehensively and more realistically track the search and choice processes than past studies that dealt solely with brand or store choice. Hence, this study is designed to overcome the inappropriateness of packaged goods methodologies and is tailored to the nature of durable goods purchasing.

Potential Implications of this Research

It is clear that marketers need to develop and use better research methodologies when studying durable goods purchase decision making. But, why do marketers need to be able to understand the consumer's information seeking and decision making processes used in durable goods purchasing? The practical implications resulting from a greater understanding of prepurchase processes are numerous.

If marketers wish to influence the prepurchase search process, then they must understand how it is presently carried out. "Marketing managers are particularly

interested in external information search as this provides them with direct access to the consumer" (Hawkins, Best & Coney, 1983, p. 483).

"Knowledge of search is also required by marketers for the planning of distribution and communications programs" (Newman, 1977, p. 79). With a knowledge of how consumers go about searching for information as well as the sequential pattern of their searches, manufacturers and retailers will be in a better position to develop marketing strategies regarding distribution and promotion of their products. Hawkins, Best and Coney (1983, p. 503) discussed marketing strategies based on information search patterns, which are shown in Figure 1. However, the search patterns are based primarily on degree of search (EPS, LPS, and RRB) and direction of brand search (evoked/non-evoked set). This matrix does not take into account the consumer's search sequence, and the position of a source within the search sequence may determine the types of information required by the consumer.

Hence, by using sequential patterns of information search as a segmentation base, marketers may be better able to design and target their marketing efforts to better defined customer segments. For example, if retail stores are found to be a frequently-used source of information early in the search process, then manufacturers may decide to use a more selective (or intensive) distribution strategy, provide better sales force training, and more

Figure 1. The Hawkins-Best-Coney marketing strategies based on information search patterns.

Target market decision making and information search pattern

Brand position	Habitual decision making (no search)	Limited decision making (limited search)	Extended decision making (extensive search)
Brand in evoked set	Maintenance strategy	Capture strategy	Preference strategy
Brand not in evoked set	Disrupt strategy	Intercept strategy	Acceptance strategy

support for their distributors' promotional efforts. If newspaper advertising is frequently used early in the search process, then perhaps advertising strategy will be modified to provide more complete information or more compelling reasons to buy a specific brand or to shop in a particular store.

In a broader sense, if distinct patterns of sequential search are found to exist for one durable good, then these patterns may be generalizable to similar types of durable goods, such as major appliances. It may be that consumers use the same search strategies when planning to buy durables for which they perceive approximately the same degree and type of risk.

A further implication of this study is in regard to consumer education and public policy efforts. It was estimated that one in five households purchased a major durable in a given 12-month period (Tigert & Ma, 1983).

Thus, a substantial number of people could benefit from efforts to aid them in making wise purchase decisions. For example, if some patterns of sequential search are found to exist that appear to result in more efficient or effective purchase decisions, then consumers can be informed about, and urged to follow, particular search sequences.

In summary, there is a need for more tailored approaches to the study of durable goods purchasing. This research is intended to address the specific problems of: (1) inadequate methodologies for measuring durable goods search processes and (2) lack of a complete understanding of external search for durables. The results of this research should be useful to durable goods marketers in strategy development and day-to-day tactical efforts as well as in consumer education efforts. In the broadest sense, "knowledge of search can contribute to understanding the nature of human behavior generally" (Newman, 1977, p. 79).

Statement of the Problem, Research Objectives,
and Research Questions

Consumers in the market for durable goods, as opposed to nondurables, generally conduct more extensive external searches for information before making purchases. Hence, it is crucial for marketers of durable goods to understand the consumer's prepurchase search process if they wish to influence the search and decision-making processes.

Whereas marketers of durable goods may be able to identify the information sources commonly used by consumers,

the patterns of information source usage, and the extent of source usage, the research in the external search area appears to have ignored the consumer's information acquisition PROCESS. Where do consumers begin when they decide they have a need to purchase a durable good? What information sources are sought out initially to help them structure their searches? What information sources are subsequently used to help build an information bank, which can be used to narrow down the alternatives? Do some information sources typically lead consumers to certain other information sources?

Is the use of certain information sources associated with a shorter or longer information search process? Are some information sources used primarily in the early stages of search while other information sources are used in later stages of search? Is the use of an information source influenced by its ease of accessibility? Are information sources that are most easily accessed sought after first? Are information sources that are thought to be the most useful sought after first? Is the possession of certain demographic, socioeconomic, or psychological traits associated with distinct sequential search patterns? To date, these questions have not been answered.

The major focus and objective of this study is the investigation of consumers' sequential processes of information search and acquisition, which lead to the purchase of a durable good. A second objective is to

attempt to identify distinct information search patterns. A third objective is to examine the sequential search patterns in order to determine if other variables are related to the use of a particular sequential search pattern. Within the context of a simulated information-seeking and purchase decision-making process, this study is concerned with the following major question and related questions:

MAJOR QUESTION:

RQ-1: Are there distinctly different sequential patterns of information source usage found in consumers' decision-making processes for the purchase of a durable good? If so, what are the configurations of the sequential patterns of source usage?

COROLLARY QUESTIONS:

RQ-1a: Does the use of a particular information source in an information-seeking sequence for a durable good lead to varying probabilities that other information sources will occur next in the sequence?

RQ-1b: Is the use of a particular sequential search strategy related to one or more demographic, socioeconomic, and/or psychological variable(s)?

RELATED QUESTIONS:

RQ-2a: Are information sources that are more easily accessed sought after first in the information search process for durable goods?

- RQ-2b: Are information sources that are perceived as being more useful sought after first in the information search process for durable goods?
- RQ-3: In general, will seller-provided information sources be used in proportions greater than they are found in the shopping environment during prepurchase search for durable goods?
- RQ-4: Is there a relationship between the use of certain information sources (such as a neutral source) and the extent (number of sources used) of search?

With the major objectives and research questions stated, we can turn next to the organizational outline for this dissertation.

Organization of Dissertation

This dissertation will be organized in the following order:

- (1) This first chapter introduced the problem area and briefly discussed the need for learning more about the information acquisition process. The research objectives and research questions were posed.
- (2) The second chapter includes a comprehensive review of the literature regarding: (a) search behavior as a component of the comprehensive consumer behavior models, (b) search behavior models, and (c) search behavior for durable and/or shopping goods as reported in empirical studies. The review of the literature reveals the need for a different research methodology

and the lack of knowledge regarding all aspects of durable goods search.

(3) The third chapter will present the research questions along with a theoretical component preceding each research question.

(4) The fourth chapter will present the research design and methodology. This includes a discussion of the rationale for choosing a laboratory method that involved a computer interactive data collection device. A research paradigm, which was developed to analyze process data, is introduced.

(5) The fifth chapter will present the research results. This includes the strategy and rationale for data analysis as well as an interpretation of the results.

(6) The final chapter will: (a) summarize the major outcomes of this study, (b) review the limitations of the research, (c) present the marketing implications of the results to marketing managers, and (d) include suggestions for future research.

CHAPTER II

LITERATURE REVIEW

Introduction

The ensuing review of the consumer search behavior literature will be divided into four sections. The first section will present search/information acquisition behavior as it is embedded in the more comprehensive models of consumer behavior. The purpose of this section is to present search behavior in the context of a larger activity, that being purchase decision making.

The second section will present the general information acquisition models, which deal more specifically and in greater detail with search activity. This section provides more insight into the dimensions and possible causes of consumer search behavior.

The third section discusses the unique characteristics of durable goods and shopping goods as they relate to prepurchase search behavior. Finally, the results of published studies regarding consumers' searches for durable goods will be presented and discussed in the fourth section of this chapter. These studies lend support to the consumer behavior models and provide a strong foundation for the present research.

Hence, the review of the literature begins very broadly by introducing general consumer behavior models. It moves to a more focused view of search behavior models and finally to a very narrow presentation of individual studies

regarding the search behavior that precedes durable goods purchasing.

Comprehensive Consumer Behavior Models

Prepurchase search behavior represents one aspect of consumer behavior and is a component of all the major consumer behavior models. One of the earliest comprehensive consumer behavior models is the Andreason (1965) Consumer Decision Model. This model is one of the few that present both the types of information and types of sources that consumers use during information search.

Nicosia's (1966) model of consumer behavior is a relatively simple model with only four fields which include: attitude, search and evaluation, decision, and storage or consumption. Engel, Kollat, and Blackwell developed their first consumer behavior model in 1968. Most recently they have developed three different models which are based on level of involvement and routinization of the decision process. Their High Involvement Decision Process model is most relevant to durable goods purchasing because it is for this type of good that the consumer is most likely to be motivated to search for new information.

The Howard-Sheth (1969) consumer behavior model depicts search activity as an important function that could lead to learning, brand comprehension, attitude, and intention formation, which could lead ultimately to the act of purchasing. Sheth's (1974) Family Decision-Making Model is relevant to this thesis since the purchase of a durable good

often is the result of a multi-party purchase decision. The predispositions of each person merge with exogenous variables to determine whether the purchase will be primarily autonomous or jointly made.

Bettman's (1979) Information Processing Model of Consumer Behavior takes into account the individual's motivation, goal hierarchy, and processing capacity, all of which influence attention to information, external memory search and active external search for information.

Resulting from an analysis of several consumer behavior models, Zaltman and Wallendorf (1979, p.540) were able to identify the essential variables and linkages in any consumer behavior model. The search component was one of the essential elements found to be crucial to any comprehensive consumer behavior model. Search may lead the consumer to be exposed to external stimuli, and these stimuli may be internalized and utilized later in the purchase decision-making process.

The adoption of an information-processing model of consumer behavior suggests that one views the consumer as a thinker and/or problem-solver. In fact, Berkman and Gilson (1978, p. 407) treated choice behavior as "problem solving through information seeking and preference formation for a given brand or store." In addition, "the inclusion of search (in consumer behavior models) reflects a view of consumers as proactive" rather than reactive or passive (Zaltman and Wallendorf, 1979, p. 540).

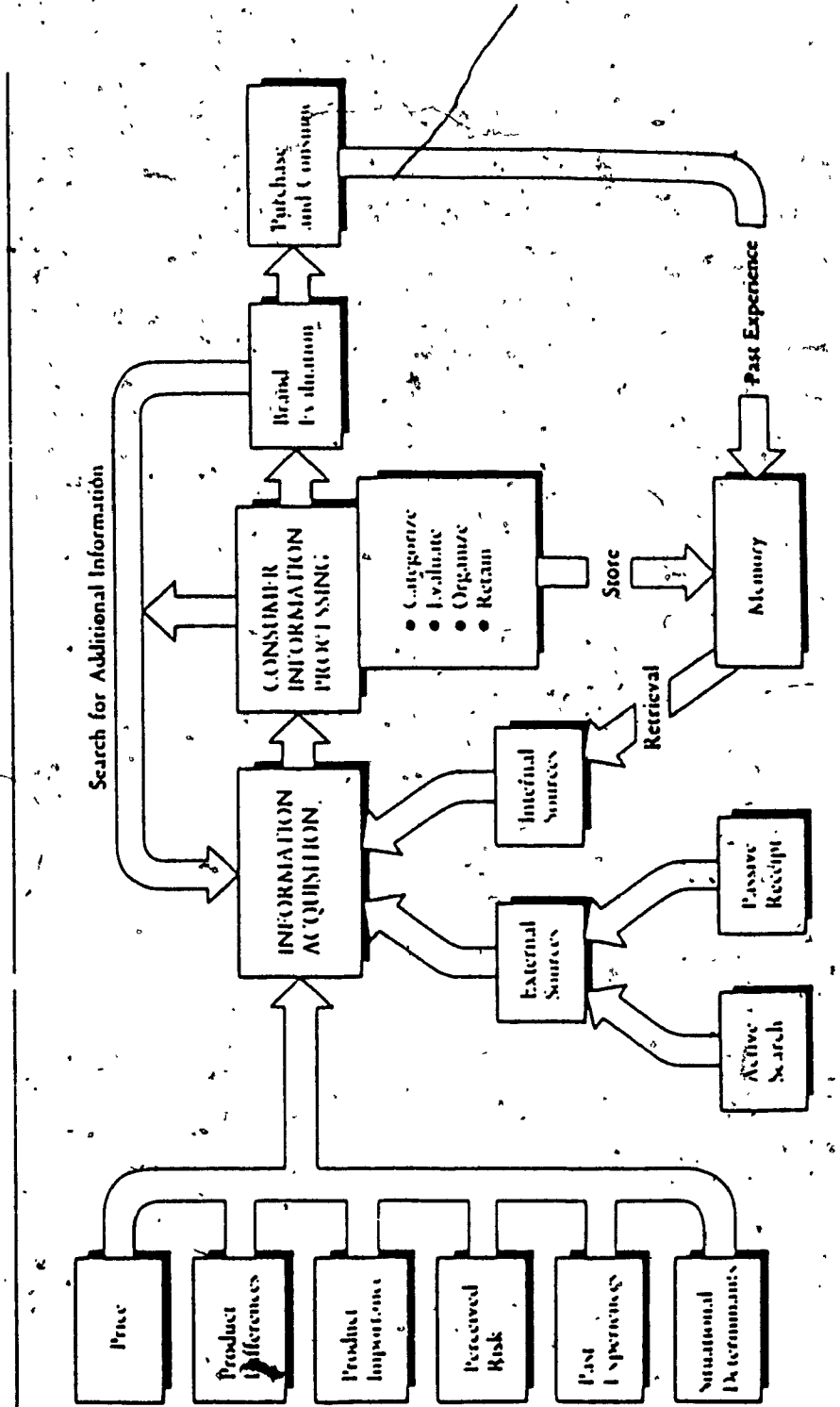
It is the information processing perspective of consumer behavior that one might expect to best represent the consumer who makes a major durable goods purchase--a purchase that is relatively complex, unfamiliar (requiring at least limited problem solving), and/or expensive. Thus, while search is a component in all of the comprehensive models of consumer behavior, the models developed by Engel, Kollat, and Blackwell and James Bettman--which incorporate an information processing perspective--seem to be most relevant to durable goods purchasing.

Information Acquisition Models

According to Assael (1984, p.535), information acquisition and information processing are two major consumer roles in the marketing communication process. The consumer must first be exposed to and acquire information before being able to process this information. Information search is the primary method of information acquisition.

However, Bettman (1979) also proposed that individuals can acquire information by being confronted with it, rather than actively searching for it. Hence, by being confronted one can acquire information through low involvement learning or by paying attention to information due to "interrupts." Congruent with Bettman's notion of "being confronted" with information is Beales' et al. (1981) notion of passively receiving information rather than actively searching for it. This is depicted in Assael's model of information acquisition, shown in Figure 2 as "passive receipt."

Figure 2. The Assael information acquisition model.



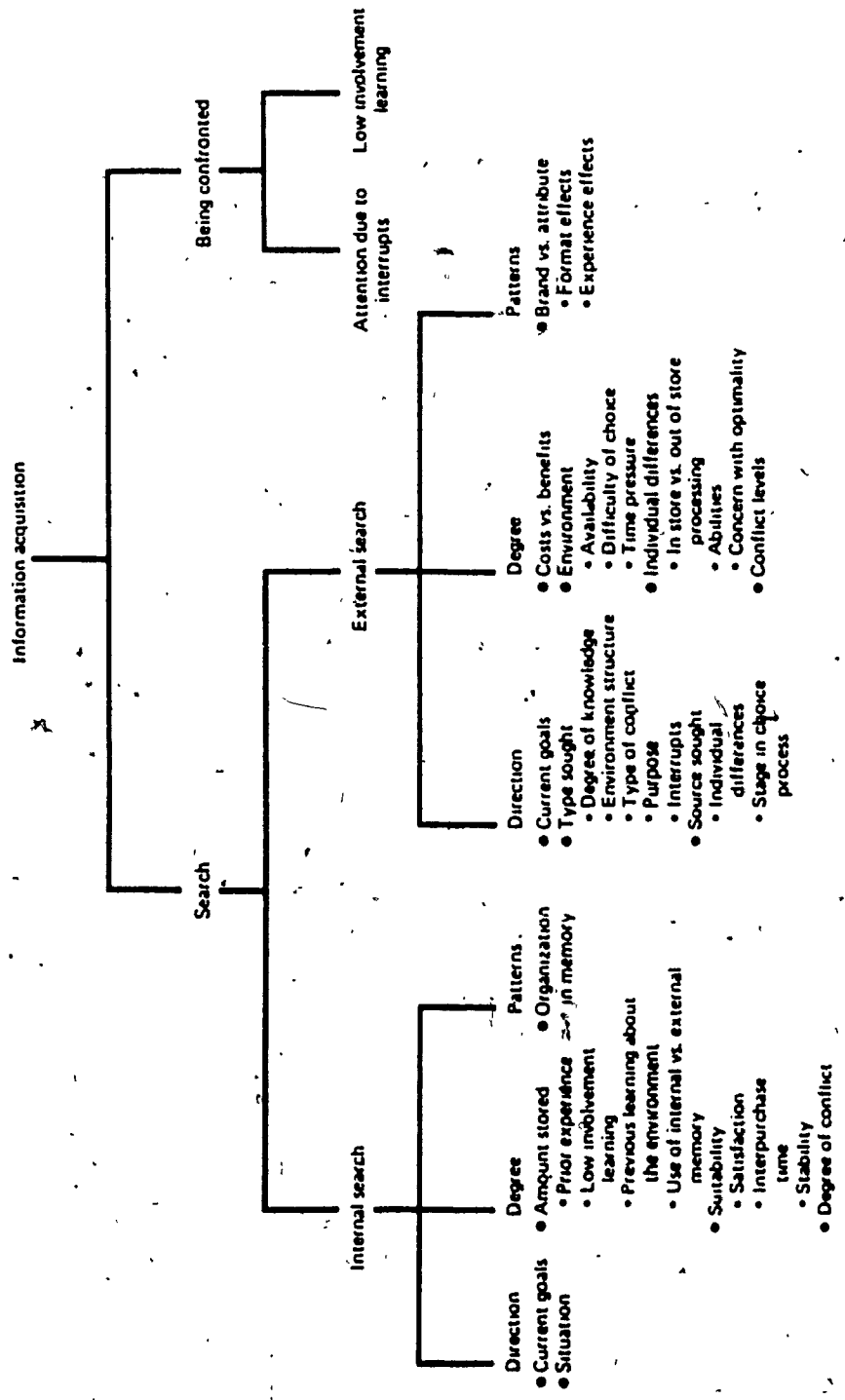
Note. From *Consumer Behavior and Marketing Action* (p. 536) by Henry Assael, 1984, Boston, Mass: Kent Publishing Co. Copyright 1984 by the Kent Publishing Company.

Information search can be dichotomized into internal search and external search categories. Both are active in the sense that the consumer voluntarily seeks information. Engel and Blackwell (1982, p. 321) define search as "motivated exposure to information with regard to a given alternative." Walters (1978, p. 117)* defined consumer search as "the mental and physical activities undertaken by consumers to provide information on products and store alternatives."

Bettman (1979, p. 105) defines internal search as "information sought from memory" and external search as "information sought from outside sources." Engel and Blackwell (1982, p.323) define external search as "a motivated and completely voluntary decision to seek new information." While internal search is a cognitive activity, Berkman and Gilson (1978, p. 405) describe external search as a physical activity. The consumer must do something in order to seek out and be exposed to an external source of information.

Bettman's (1979, p. 109) "Framework for Viewing Consumer Information Acquisition" is quite elaborate regarding the dimensions of both internal and external search. The three major dimensions of external search outlined by Bettman and shown in Figure 3 are the direction, the degree, and the patterns of search.

Figure 3. The Bettman framework for viewing information acquisition.



Note. From An Information Processing Theory of Consumer Choice (p. 109) by James R.

Bettman, 1979, Reading, Mass: Addison-Wesley Publishing Co. Copyright 1979 by Addison-Wesley Publishing Co.

The direction that the external search will take depends on the consumer's "current goals" as well as on the type of information sought and type of source desired. The type of information sought may be influenced by the level of the consumer's knowledge, the structure of the consumer's environment, the type of conflict being experienced, the purpose of the information, and interrupts. The type of source sought may be a function of the stage in the choice process that the consumer is in as well as individual differences regarding source preferences (Bettman, 1979, p. 109).

The degree of search is a function of: (a) the consumer's perception of costs versus the benefits of search, (b) the environment--the availability of information, the difficulty of the choice, and one's perception of time pressure, (c) individual differences with respect to one's abilities, concern for optimality, and type of processing (in-store versus out-of-store), and (d) conflict levels experienced by the consumer (Bettman, 1979, p. 109).

Bettman (1979, p. 109) suggests that search may be described as occurring in a brand search or an attribute search pattern. A consumer using a brand search pattern would seek all information on one brand at a time. A consumer using an attribute search pattern would seek information on one attribute at a time for all brands being considered. Whether the search is by brand or attribute may

be due to the format in which the information is presented or the experience of the consumer. Consumers might also use a phased search strategy which involves switching from brand to attribute search processes.

However, it is the "patterns" dimension of external search that appears to be less comprehensive than the other two external search dimensions described by Bettman. Brand/attribute search is a pattern category based on type of information sought and the sequence in which it is sought. Another possible pattern category is one based on type of information source sought and the sequence in which the information sources are sought. A brand or an attribute search could yield a pattern such as brand one/all attributes, brand two/all attributes, and brand three/all attributes or attribute one/all brands, attribute two/all brands, and attribute three/all brands. However, an external search pattern based on type of source used could yield a pattern such as source type a, source type b, source type c, etc.

Sequential patterns of source usage are simply another way of looking at the patterns dimension of external search. The knowledge of sequential patterns of source usage by marketers may be just as desirable, if not more so, than the knowledge of brand and attribute patterns of search by consumers. From a practical point of view, the marketer may find it more useful to know which information source the consumer uses (as well as which information sources commonly

lead to other information sources) during the prepurchase search. The marketer may benefit more as a result of sending any message through a medium to which the target audience is exposed than by sending an appropriate message through a medium that is not used by the target market.

Thus far, the major consumer behavior models have been presented in order to show how the activity of consumer external search fits into the overall consumer choice process. Assael's model of information acquisition and Bettman's framework for studying information acquisition were presented to highlight the major influences on external search behavior. Bettman's framework identifies three dimensions of external search--direction, degree, and patterns.

The patterns dimension of search has heretofore been defined in terms of brand or attribute processing. It is proposed here, however, that external search patterns could also be defined in terms of source usage sequences.

The next section of this literature review will introduce and discuss durable and shopping goods and will present empirical studies which provide more specific information regarding the three dimensions of external search relevant to durable goods.

Durable Goods and Shopping Goods: Definition and
Importance of Search

Durable Goods

How the consumer perceives the product and the purchasing problem determine the subsequent actions, including search, which may lead to the purchase decision. The American Marketing Association Committee on Definitions (Alexander, 1960) has defined durable goods as "tangible goods which normally survive many uses." Hansen (1972) suggested that a durable product is one that will last a year or longer. Matthews et al. (1964) felt that a useful life of three years should be used as a minimum in defining durable goods.

These definitions imply that durable goods are purchased less frequently than nondurables, which are consumed in a short period of time and which require repurchasing at shorter intervals. The fact that durable goods survive many uses would also lead one to the conclusion that the consumer is less likely to have a lot of purchasing experience for these goods relative to nondurables. Thus, the purchase decision will tend to be a more difficult task for consumers of durables in relation to the purchase of nondurables.

Shopping Goods

Copeland (1923) first described three classes of goods--convenience, shopping, and specialty goods--based on consumers' shopping habits. The American Marketing

Association's official definition of shopping goods is as follows: "Those consumers' goods which the customer, in the process of selection and purchase, characteristically compares on such bases as suitability, quality, price, and style (Alexander, 1960).

It is useful to present this convenience/shopping/specialty goods trichotomy prior to a discussion of consumer external search for durables. This trichotomy describes three different types of search strategies which are determined by the consumer's perception of the product, the product class, and the situation. When the consumer perceives that there are differences among brands and that a better decision can be made by making comparisons among them, then the product is a shopping good for that person. If the consumer wishes to buy a product with a minimum of effort (at the first store with little brand comparison), then the product is a convenience good for that person. If the consumer has a definite brand preference and is willing to expend a great deal of effort to obtain it, then the product is a specialty good for that consumer.

A durable good is not likely to be purchased frequently, but some consumers may purchase durable goods with as little effort as is characteristic of habitual convenience goods purchasing. A durable good may be sought after like a specialty good, if consumers believe that the benefit of extra purchasing effort is worth the cost.

However, the definition of specialty goods implies brand loyalty, and the nature of durable goods purchasing causes it to be less conducive to brand loyalty than more frequently-purchased nondurables. One survey, which was cited in the Wall Street Journal (Lehner, 1984), reported that almost two-thirds of affluent car buyers had no loyalty to, any particular auto manufacturer. Berkman and Gilson (1978, p. 238) also reported that "brand loyalty is lower for hard goods than for packaged goods." Hence, the long inter-purchase time between durable goods purchases may make it less likely that consumers will buy out of habit and more likely that consumers will conduct some external search.

The shopping goods definition can be distinguished from the convenience and specialty goods definitions by its emphasis on comparison activity. Holton (1958) defined shopping goods to reflect the perceived costs involved in comparison shopping. This comparison procedure can be quite extensive (involving comparison of many brands on many attributes in many stores) or can be extremely limited (perhaps involving comparison of only two brands in one store on one attribute). If one viewed shopping goods as being on a continuum ranging from very little comparison to a great deal of comparison, the majority of consumers would probably classify the same durable good purchase in the shopping good category as well.

The United States Government categorizes the following product classes as durable goods: automobiles and

automobile parts; portable and major appliances; furniture and mattresses; china, glassware, tableware, and utensils; jewelry and watches; recreation goods including books, radios, televisions, records, musical instruments, sports equipment, and durable toys (Dickson & Wilkie, 1978, p. 2).

Whether the consumer perceives a particular durable good to be a convenience, shopping, or specialty good will determine the extent of his or her prepurchase search. Greenberg and Bellenger (1974) found that consumers of durables are not at all in agreement about whether certain durables (such as encyclopedias, tires, cameras, and color televisions) are convenience, shopping, or specialty goods. The study suggested that there is more routinized decision making in the purchase of durable goods than would be expected for such infrequently purchased goods.

On the other hand, Bucklin (1962, p. 52) regards shopping goods as "those for which the consumer regularly formulates a new solution to his need each time it is aroused. They are goods whose suitability is determined through search before the consumer commits himself to each purchase." The necessity of a new solution is caused by the infrequency of purchase and the resulting changes in price, style, and technology, as well as consumer needs.

Bucklin contends that the consumer experiences either limited or extended problem solving in the purchase of a shopping good. He states further that "whether the consumer searches diligently, superficially, or even buys at the

first opportunity, however, does not alter the shopping nature of the product" (p. 52). Hence, Bucklin's definition of shopping goods does not require that each consumer conduct a search and make comparisons, only that the purchase be of the nature that normally requires shopping and comparing before buying.

Kaish (1967) has defined shopping goods in terms of the amount of cognitive dissonance aroused. He states that "shopping goods are goods that arouse high levels of prepurchase anxiety about the possible inappropriateness of the purchase" (p. 31). Goods falling into this category are those "high in economic or psychological importance, which contain significant performance differences, and which have physical qualities that are readily related to the performance characteristics" (p. 31). Hence, if the product is not perceived to meet these "specifications" by the purchaser, then search behavior may be limited.

Bucklin's (1962) Product/Patronage Matrix contributes further to the discussion of search behavior. It combines consumers' product motives with their patronage motives, and it is based on how well developed the consumer's preference map is with respect to brands and stores. This matrix presents nine possible types of consumer buying behavior and shows that patronage motives confound consumer behavior with respect to the consumer goods classifications. In particular, the matrix illustrates that consumers of shopping goods will exhibit varying levels of search,

depending on their patronage motives. This is an important key to understanding why researchers have found evidence of little inter-store search among buyers of durable goods.

However, the Product/Patronage Matrix is weak from the perspective of total prepurchase information seeking behavior. Consumers may conduct extensive out-of-store searches (using the advertising media, neutral media, and word-of-mouth media) in addition to shopping in retail stores. Hence, while the Product/Patronage Matrix considers the consumer's preference maps for both products and stores, and it describes nine different shopping strategies, it does not provide a complete framework for the study of prepurchase information seeking and acquisition.

To summarize, durable goods are those goods that are used repeatedly and have a relatively long life. Consumers are likely to view durable goods as being synonymous with shopping goods since:

- (1) many durable goods are relatively expensive and therefore carry higher financial risk,
- (2) consumers buy durable goods infrequently and lack a great deal of purchasing experience,
- (3) many durable goods are also technically complex, making it difficult to evaluate them.

External search would seem to be the logical solution to these problems. The consumer is more likely to shop around if the item is somewhat expensive (financially risky) because searching may lead the purchaser to find a better

price or value, thereby reducing the financial risk. Since durable goods are purchased infrequently, the consumer lacks purchasing experience. In addition, the consumer may have forgotten information since the last purchase, the consumer's needs may have changed since the last purchase, and what the market has to offer may have changed since the last purchase. Due to these factors, the consumer may need to search more extensively for a durable shopping good than for a nondurable convenience or specialty item.

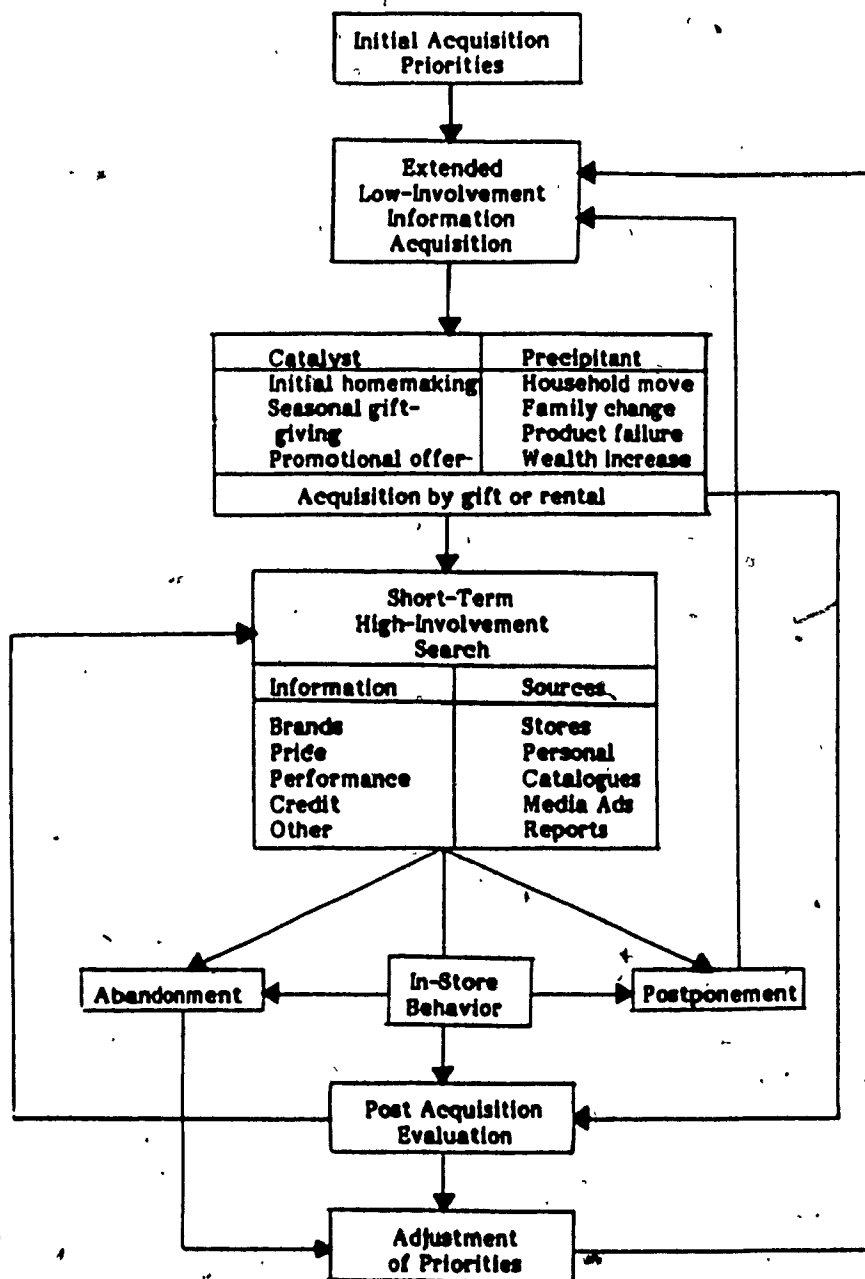
Since many durable goods, particularly appliances and home electronic equipment, are quite technical in nature, the average consumer may have difficulty evaluating and comparing brands prior to purchasing. This difficulty may be eased somewhat by using external information sources such as Consumer Reports, friends and relatives, store personnel, advertisements, etc. The likelihood of using and relying on external sources of information is, therefore, greater for technical products that are difficult to evaluate.

Hence, durable goods are frequently goods for which the consumer finds it necessary to conduct an external search prior to purchase decision making. This external search may include retail stores as well as the advertising media, friends and relatives, and consumer reporting media.

Major Durables Acquisition Model

In order to bridge the topic of durable goods with the study of search behavior, a model developed by Dickson and Wilkie (1978) will be presented in Figure 4 and discussed.

Figure 4. The Dickson-Wilkie model of the acquisition of major durables.



Note. From the Consumption of Household Durables: A Behavioral View (p. 10) by P. C. Dickson and W. R. Wilkie, 1978, Cambridge, Mass: The Marketing Science Institute. Copyright 1978 by the Marketing Science Institute.

Their model is entitled a "Model of the Acquisition of Major Durables," and it is a descriptive model of the acquisition process. The first stage, "Initial Acquisition Priorities," is posited to occur when the consumer takes an inventory of those durable goods owned and unowned and determines the order in which desirable, but unowned goods will be acquired. Clark and Soutar (1981) and Beckwith and Lehmann (1980) have shown that consumers do indeed possess priority patterns for durable goods acquisition.

Consistent with the Engel, Kollat, and Blackwell models of high and low involvement search, Dickson and Wilkie (1978) indicate that consumers do acquire information over an extended period of time in low-involvement contexts, and that either a "catalyst" or "precipitant" may trigger high involvement search, which is likely to be shorter in duration. During the high involvement search, decisions must be made regarding the type of information to seek and the sources of information to be utilized.

The "In-Store Behavior" stage may refer to interactions between the salesperson and the customer, other behaviors, or the ultimate purchase act. However, this juncture is a major weakness in the model. In this author's opinion, the purchase act should be represented as a separate stage in the model, occurring after In-Store Behavior and before Post-Acquisition Evaluation. This change would make it possible for in-store behavior to lead to either abandonment, postponement or purchase.

Finally, the Dickson-Wilkie model depicts a post-acquisition evaluation which is shown to affect both future search behavior (via beliefs, attitudes, and intentions) and the consumer's acquisition priorities. Or more simply, since in-store behavior is one aspect of information gathering in high involvement search, the "In-store Behavior" box in the model can be changed to "Purchase Act" and the arrows leading from it to "Abandonment" and "Postponement" could be eliminated. One final critique of this model is that it assumes that all consumers go through a "short-term high-involvement search." As the Engel-Kollat-Blackwell "Routine Decision Process Model Based on High Involvement" illustrates, it is possible that no external sources and no further information will be sought prior to a repurchase.

What may be even more revealing than the Model of the Acquisition of Major Durables are Dickson's and Wilkie's (1978) propositions underlying the model. They are:

1. Deliberate and highly involved search behavior, however short, is either precipitated by an unexpected event or triggered by an expected event which converts priorities or stalled plans into action.
2. Casual acquisition of product information may occur over an extensive time before precipitating or catalytic events happen. This information is obtained under very different conditions of

interest, concern, and product involvement from what will be found at stages of deliberate and intensive search.

3. The search for and choice of the purchase outlet frequently may precede the consideration of specific brands and, consequently, clearly influences the composition of the evoked choice set. Store loyalty can be a more important concept than brand loyalty.
4. The expertise and interactive skills of store personnel are significant in the purchase of major durables.
5. After sufficient search, immediate purchase may be abandoned or postponed and the process may lie dormant until activated by a future event. Abandonment will have an impact on acquisition priorities for other products.
6. The decision process is under the pervasive influence of a number of cultural and economic factors (pp. 8, 10).

Search is an extremely important activity in the purchase of durable goods, as is evidenced by the above model as well as the following study. Day and Deutscher (1982) attempted to determine if attitudes could be used to model brand choice behavior for major durable goods (appliances). A consumer panel was interviewed initially and then again six months later, and those who purchased a

major appliance during this time were included in the analysis. Results of this study showed that 57% of the purchasers did not mention the brand they had just purchased during the initial interview. Hence, it may be concluded that their consideration sets were expanded and attitudes developed or changed during the search and decision process. The authors also suggested that an initial consideration set "does not significantly limit subsequent choice behavior." Furthermore, the authors concluded that "attitudes toward brands of major appliances appear to be formed mainly through a process of learning without involvement," and, therefore, are susceptible to change. In support of this, Houston (1979) found that the role of advertising for high risk, durable products was mainly to generate awareness and interest in brands rather than to generate trial or higher order beliefs or affect. Finally, it was concluded that attitudes toward appliance brands were weak predictors of brand choice except in the case of brands that were part of a full-line strategy with national advertising support. In this case, attitudes which may result from previous satisfactory experience and then reinforced by advertising may be stronger and less susceptible to change.

Up to this point, the literature review has proceeded from the comprehensive consumer behavior models, to an information acquisition framework and model, to definition and discussion of durable and shopping goods, and finally to an acquisition model of durable goods. The latter model

presents consumers engaging in two types of information acquisition processes, those being extended, low involvement information acquisition (passive) and short-term high-involvement search (active). Since the high-involvement search is more deliberate and, therefore, more measurable, it is the type of search chosen for measurement in this study.

Furthermore, Dickson and Wilkie depicted high-involvement search as having an information source component and an information type component. Both of these components have been included in the computer simulated purchasing task so that the test subjects would be faced with a fuller range of market data (not just brand and attribute information). However, this model points out that a considerable amount of low-involvement information acquisition occurs, which may influence consumer attitudes and behavior. Hence, it should be noted that the research conducted for this dissertation is limited in generalizability because it was restricted to a short-term, high-involvement search context. In the next section, the theoretical and empirical literature regarding the search for durable goods will be presented.

Review of the Research Regarding External Search

Introduction to External Search Literature

Having first presented the conceptual framework of consumer external search behavior, specific research regarding external search for durable goods will be presented in this section. Using Bettman's three dimensions

of information acquisition (direction, degree, and patterns), those studies dealing primarily with type of source(s) used (direction), number of sources used (degree), and importance or impact of information sources will be reviewed first. Subsequently, the literature pertaining to patterns of external search will be presented.

What motivates the consumer to conduct an external search? Engel and Blackwell (1982, pp. 324-26) cite the "quality and quantity of existing information" possessed by the consumer as one motivating factor. In relation to the quality of information stored in memory, three variables were mentioned to affect information search:

1. satisfaction: the greater the satisfaction with the results of past purchases, the lower the probability that search will occur in the future when similar circumstances lead to problem recognition.
2. interpurchase time: the greater the interpurchase time, the higher the probability of external search.
3. changes in the mix of alternatives: the greater the rate of change, the higher the probability that search will occur (p. 325).

Other factors mentioned that can trigger external search are: the ability to recall information regarding past purchasing problem solving, the amount of risk perceived by the consumer with respect to the purchase

decision, and the consumer's confidence in his/her decision-making ability. Risk can take a variety of forms such as financial, social, psychological, and performance risk as well as risk related to the necessity of making multiple decisions for a single purchase and the length of time the consumer will be committed to using the product after purchase. Thus, in order to reduce such risks, the consumer may conduct an external search.

Beales et al. (1981) provide some explanation for consumers' limited external search behavior using the cost-benefit principle as a rationale. They posit that consumers will search for information until the costs of acquiring it exceed the benefits. This principle can be applied to the consumer's level of experience and knowledge. For example, the benefits of external search may be perceived as being very small for consumers who "do not have the memory structure necessary to evaluate and interpret" information as well as for consumers who "believe that they possess most of the available information about the relevant options" (Beales et al., 1981, p. 12).

The cost-benefit principle can also be applied to the consumer's perceptions of variance in quality and price across available brands. If internal memory indicates that most brands are pretty much alike, then expected gains from search will be minimal. However, consumer beliefs or perceptions residing in internal memory may often be inaccurate, and the consumer may not be well informed. Such

consumers "do not realize they should engage in additional search" (p. 17).

While the lack of very thorough external search for durables may be thought to be due to poor measurement techniques or to the belief that many consumers are lazy, ignorant or indifferent, Ratchford (1980) developed a model to determine the value of search for potential purchasers of major appliances. His results suggest that a limited search may be near-optimal. He found that "most of the expected dollar gains (of search) are exhausted after the first three searches, and become negligible after five searches" (p. 17). Furthermore, he suggested that the benefits of search for more knowledgeable consumers would be even smaller. While the author admitted that behavioral elements were missing from his model and that the model may not explain actual search behavior, his model does provide some useful insights into search behavior. Many consumers may unknowingly and unconsciously perform rough calculations similar to the calculations made in this model to assess the value of information seeking.

Also discussed by Beales et al. (1981) with regard to the cost-benefit principle was the fact that the cognitive strain and mental stress of evaluating too many alternatives may increase the perceived costs of search beyond the perceived benefits. Hence, consumers may limit the number of brands, stores, and/or attributes searched and evaluated in order to reduce the cognitive load. Of course, the

tolerance for such stress varies from individual to individual.

Examining the whole spectrum of information sources, Beales et al. also discuss the costs of obtaining information from each type of source. Internal information is less costly to access than information from external sources. Passively acquired information is less costly to the consumer than actively acquired information. With respect to external information sources, seller-provided information is the least costly to acquire, followed by personal inspection and disinterested third parties, in that order. (Personal sources, such as friends or relatives, were not discussed in this study.)

Hence, the cost of acquiring information in terms of time, effort, or money must not outweigh the benefits or value of the information available. Further, the benefit or value of the information may result from the consumer's perception of risk, confidence in purchasing, satisfaction with a previous purchase, frequency of purchase, and the consumer's memory and cognitive capacity. Thus, search may be motivated by a number of circumstances and variables.

Direction and Extent of External Search

With an understanding of the major factors that motivate information search beyond that which is held in internal memory, it is desirable to discuss the types of information sources that may be used in the external search

process. Kotler (1980) identifies four types of information sources used by consumers in their information searches:

1. Personal sources (family, friends, neighbors, acquaintances)
2. Commercial sources (advertising, salesmen, dealers, packaging, displays)
3. Public sources (mass media, consumer rating organizations)
4. Experiential sources (handling, examining, using the product) (p. 157).

Kotler states that sources may be utilized for different reasons in the decision process. For example, commercial sources may be used primarily for acquiring information, while personal sources may be utilized more to legitimize the consumer's predisposition or to evaluate the alternatives.

Engel and Blackwell (1982) classify information sources somewhat differently. They classify information sources into general and marketer-dominated categories, with those categories subdivided into face-to-face and mass media categories. LeGrand and Udell (1964) and Udell (1966) classified information sources into out-of-store shopping and in-store shopping categories. Newman and Staelin (1972) studied four categories of information sources, those being personal, neutral, advertising, and retail stores. Information sources may also be classified as being controllable or uncontrollable from the seller's point of

view (Davis, Gaultinan, & Jones, 1979). Kiel and Layton (1981) have proposed that the sources of information dimension may be composed of retailer search, media search, and interpersonal search. Beales et al. (1981) utilize three external source categories--direct inspection, disinterested third parties, and seller-related sources.

With this collection of diverse classification systems of consumer information sources, it will be difficult to compare studies reported in the literature. Some have reported using information source usage indices, others have reported only the use of one or two information sources. Nevertheless, the research regarding direction and degree of external information search will now proceed.

A major research project undertaken by George Katona and Eva Mueller in the early 1950s is considered to be a true pioneering effort and a substantial contribution to the field of consumer behavior. Katona and Mueller (1955) studied prepurchase decision making for major household durables such as televisions, refrigerators, stoves, and washing machines. They measured five dimensions of prepurchase deliberation, which included: (1) extent of circumspectness, (2) extent of information-seeking activity, (3) choosing with respect to price, (4) choosing with respect to brand, and (5) numbers of features considered (p. 42). Below is a list of several of their findings:

1. Regarding circumspectness, it was found that over 50% of the respondents stated that they planned durable

purchases at least several months ahead; extensive family discussion prior to a durable goods purchase was just as likely as no discussion; and the majority (70%) reported that little consideration was given to the alternatives of the given purchase, and they did not hesitate in making the durable good purchase.

2. Regarding extent of information seeking, one-third of the durable good buyers used either one source of information or acquired no information. Friends and relatives were cited most frequently as an information source, followed by stores. However, 58% of the sample reported visiting either one or no store before buying. One-third of the sample reported obtaining information from a print medium.

3. More than half (57%) of the subjects indicated that they considered only models in one price range, while 39% responded that they considered models in more than one price range.

4. One-third of the sample knew which brand they wanted when they began, while the others considered more than one brand or were open to many brands.

5. The most frequently reported product features included brand, mechanical properties, followed by size or capacity, appearance, performance, and price. Other than price and brand, it was reported that only 35% of the purchasers had considered more than one feature.

6. Education of the head of the family was found to be positively related with degree of deliberation.

7. Sample members with medium-to-high incomes were found to be more deliberate purchasers than members of the two lowest or the highest income groups.

8. Younger purchasers are more highly motivated to search for information than older purchasers.

9. With respect to an attitude toward shopping, each income category seemed to have approximately the same proportion of people who enjoyed shopping and who did not like to shop around.

10. Clerical and sales personnel were more deliberate in their prepurchase decision process than people in other occupational groups.

The Katona and Mueller study was not only an important study because it was a first but also because it included a large sample and studied several dimensions of pre-decision deliberation.

LeGrand and Udell (1964) conducted a study among purchasers of television sets and furniture to determine what sources of information they used as well as the helpfulness and usefulness of out-of-store information sources and in-store shopping. They reported their findings for televisions and furniture separately as well as together, and it is evident that sources used and extent of source usage differs between buyers of the two product classes. Television purchasers visited an average of 2.2

stores, while furniture purchasers visited 3.3 stores on the average. Forty-one percent of the television buyers visited zero or one store compared to 24.4% of the furniture purchasers.

Using aided recall, the most frequent overall responses given for the sources-of-information-used question (excluding store visits) were: (1) newspaper advertising, (2) friends or acquaintances, (3) magazine advertising, (4) telephoning a store, (5) catalogs, (6) television advertising, and (7) consumer rating magazines, in that order. However, friends and acquaintances were mentioned twice as frequently by television purchasers than by furniture purchasers. Also, television advertising and consumer rating magazines were mentioned far more frequently by television purchasers.

In terms of helpfulness of out-of-store sources of information, the following sources were found to be most helpful in descending order: friends and acquaintances, consumer rating magazines, newspaper advertising, telephone calls to store, Yellow Pages, catalogs, and magazine advertising. The most helpful sources for making quality comparisons were store visits, friends and acquaintances, consumer rating magazines, sales and repair personnel, and experience for television purchasers, while store visits predominated for furniture buyers. For making price comparisons, store visits were overwhelmingly the most helpful source for both furniture and television buyers, and

newspaper advertising was the second most frequently mentioned by both types of buyers.

The differing extent of store search as well as the differing usage and perceptions of helpfulness of sources between furniture and television buyers might be explained by the nature of the product classes. Televisions are more complex, functional, and standardized. Furniture is purchased for style and appearance as well as function, and it requires more personal, subjective judgments.

Udell (1966) studied the prepurchase behavior of small appliance purchasers. Of the out-of-store sources of information controllable by the marketer, the three most helpful sources were: newspaper advertising, mail-order catalogs and circulars, and magazine advertising. The most useful controllable out-of-store sources of information were mail-order catalogs/circulars and newspaper advertising. The noncontrollable out-of-store source of information reported to be both most helpful and most useful was "past experience with the product brand." Discussions with friends, relatives and neighbors was a distant second on both the helpfulness and usefulness dimensions.

Of the out-of-store sources included in the study, the usage of sources varied by marital status, sex, and income. For example, single persons mentioned the use of television and magazine advertising and discussions with friends and relatives more than married persons. Married women and higher income households were more likely to mention the use

of newspaper advertising, and married men and single women were more likely to mention the use of past experience with the product brand.

The most startling finding in this study was that almost 60% of the purchasers had shopped in only one store. With respect to all sources of information available to the consumer, 57% responded that store visits were the most helpful. The number of stores visited increased directly with price of the product and with the educational level of respondents, and inversely with age. Purchasers who were single were more likely to visit more than one store. The paucity of inter-store search may be partially explained by examining the following results. Seventy-three percent of the sample planned their purchases before their first store visit, and 65% indicated readiness to buy when they made their first store visit.

These results suggest that consumers might be pre-sold on the product/brand through sources such as advertising, personal experience, or personal recommendations. A heavier reliance on these sources of information than others may help to explain the low incidence of inter-store search. In addition, consumers may feel more confident in their judgments regarding small appliances, and there is less financial risk involved than for major durable purchases.

Kleimenhagen (1966-67) attempted to provide evidence for the classification of goods into convenience, shopping, and specialty goods categories. While he did determine that

consumers were more likely to shop in more than one store for a shopping good than for a convenience good, he also found that 74% of those searching for a shopping good visited only one store. However, this was not a longitudinal study and the shopping goods searchers in the study did not all make a purchase and may not have completed their searches.

Riter. (1966-67) conducted an early study of color television purchasers. The variables in this study were not well defined, and it is difficult to determine their exact meaning. For example, he categorized buyers into shopper and non-shopper categories on the basis of whether they shopped at several stores. However, the term, "several stores," was not defined. Forty-eight percent of the sample shopped at several stores and 52% did not. He also found that 60% of the sample purchased on their first visit to a store. Given that there was not a large number of brands available at the time of this study compared to today and, in fact, there was a shortage of color televisions, Riter found that brand name was a deciding factor in the purchase decision for more than two-thirds of the sample. He also suggested that consumers may be pre-sold before entering the store.

Dommermuth and Cundiff (1967) conducted a study of housewives to determine the extent of their inter-store search for clothing, costume jewelry, yard goods, wedding gifts, towels and sheets, and cookware. Seventy-one percent

of the buyers shopped in only one store, on the average, for all items. However, certain lines were found to effect greater search. Almost forty percent of yard goods buyers shopped in two or more stores. Those items for which there was above-average search were "relatively nonstandardized, subject to fashion and style considerations, and the choice made by the purchaser will be socially apparent and socially significant." Below average search was found for items such as men's shirts, women's gloves and blouses, towels and sheets, and cookware, which were considered by the authors to have "less style connotation and greater standardization." The authors suggest that, for the items in their study, the extent of store search is directly related to the convenience of store search. This may be truer for these items than for more costly major durables.

Brandt and Day (1972) studied consumers' decision processes for major durables costing more than \$100. They utilized three measures of search: (1) number of stores visited, (2) number of brands considered, and (3) number of information sources consulted before purchasing (personal, store, and mass media). With respect to the extent of store search, forty-eight percent of the respondents shopped in only one store. Thirty-three percent of the sample considered only one brand. They reported that brand and store search were highly correlated (Goodman-Kruskal Gamma of .70), although search for brands was more extensive than inter-store search. With respect to number of information

sources used, 16% reported relying on no information source, 46% reported reliance on one information source, 22% relied on two information sources, and 16% relied on three or more information sources.

Using multiple regression analysis, an attempt was made by Brandt and Day to find determinants of store, brand, and information search. The variables found to be related to store search and which were significant at the .01 level were: length of shopping period (-), concern over price (+), and previous experience at a store (-). The variables found to be related to number of brands considered and which were significant at the .05 level were: concern over price (+), length of shopping period (-), and payment method/use of credit (-). Finally, information search was related to brands in mind before shopping (+) and previous store experience (-). The authors concluded that demographic variables are not determinants of amount of search when situation-specific variables are included in the analysis.

Newman and Staelin (1972) conducted an extensive study of new car and major appliance purchasers, and used out-of-store and in-store information seeking indices. Forty-nine percent of the purchasers had visited only one retail outlet. One might expect that purchasers who conduct little inter-store search might also conduct more extensive out-of-store searches, but this was not found to be the case in this study. Those purchasers with higher levels of out-of-store information seeking were found to be those who also

conducted more inter-store search. Of the six out-of-store information-seeking score categories, 73% of the sample fell into the lowest three categories of search. Thus, total information seeking of purchasers of major items appears to be quite low.

The authors utilized AID analysis to find explanatory variables of search behavior. They found the following relationships:

1. Households considering only one brand at first had lower total information-seeking scores than those considering more than one brand.
2. Households considering only the brand they had previously purchased had lower information-seeking scores than those who considered only one brand not previously used.
3. Households paying a median price searched less than those paying a higher or lower price.
4. As the cost of the appliance increased, so did the total information-seeking scores of buyers. This relationship was found to be true only for car buyers who initially considered two or more brands.

Multiple Classification Analysis revealed the following results:

1. In households where the husband was the major influence, the average information-seeking score was lower.
2. Young, unmarrieds were shown to possess the highest information-seeking scores.

3. Buying experience (at least two purchases of a product in the last ten years) was shown to have a negative effect on search.

4. Those with less than twelve grades of education, college drop-outs, and those with advanced degrees were found to have lower information-seeking scores.

Finally, the authors note that their measures of types of sources used do not include a measure of the quality of information obtained from the sources. In other words, one good source may be more useful than several bad sources.

Mason and Mayer (1972) investigated search behavior of consumers for food, drugs, cosmetics, televisions, and clothing. In a comparison of purchase behavior for men's shirts, men's shoes, and televisions, it was found that 39% of the television purchasers shopped in only one store compared to 64% of the men's shirts buyers and 67% of the men's shoes buyers. The authors suggest that the higher price of the television may contribute most to an explanation of greater inter-store search. It was concluded that the majority of consumers planned these purchases in advance and that some type of pre-physical pre-store shopping occurred.

Also investigated were information sources utilized to make a decision to shop at a particular store. For televisions the rank order was: (1) newspaper advertising, (2) previous experience, (3) radio or television advertising, (4) window display, (5) suggestions of friends,

and (6) Consumer Reports or other information services. For men's shirts and shoes, previous experience was ranked number one; window displays ranked second for shoe buyers and third for shirt buyers; suggestions of friends ranked second for shirt buyers and third for shoe buyers; and shoe and shirt buyers ranked newspaper advertising fourth, radio or television advertising fifth, and Consumer Reports sixth.

Hence, we find a conflict between this study's findings and others, but it may be due to the difference in the wording of the studies' questions. "Suggestions of friends" is ranked quite low by television purchasers in the Mason and Mayer study, but has been ranked high in other studies (LeGrand and Udell, 1964; and Udell, 1966). Perhaps friends' suggestions are more important in decisions regarding brands than in decisions regarding store patronage. Media advertising appears to be quite important to television purchasers as an information source for making decisions to shop in a store, and the authors contribute this reliance to the less personalized nature of television purchasing and to the infrequency of this type of purchase.

In a study to determine if there were differences between national and private brand major appliance purchasers, Rothe and Lamont (1973) found no significant difference between the number of stores shopped in by the two purchaser types. They found that approximately 66% of the purchasers shopped in only one or two stores, 30% shopped in three to five stores, and the remainder shopped

in six or more stores. This again lends support to the contention that inter-store search is quite limited for the majority of consumers.

Regarding the importance of sources of information, national and private brand purchasers ranked the importance of information sources differently. Both purchaser types ranked "previous personal experience" as the most important source of information during the shopping and decision-making process. This finding is supported by Settle (1972) in a study in which he found that consumers of durable products would "receive more assurance from consistency information provided by personal experience over time than from information from other sources" (p. 670).

National brand purchasers ranked consumer reporting-type bulletins second, retail salespeople third, advice from friends and relatives fourth, in-store promotional displays fifth, newspaper and magazine advertising sixth, and television and radio advertising seventh. Private brand purchasers ranked in-store promotional displays second, consumer reporting-type bulletins third, retail salespeople fourth, advice from friends and relatives fifth, newspaper and magazine advertising sixth, and television and radio advertising seventh. It is interesting to note from this ranking of information source importance that media advertising is ranked least important by both types of purchasers, in contrast to Mason and Mayer (1972). Consistent with other findings is the importance of previous

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personal experience. In addition, this study recognizes retail salespeople as an information source, while Mason and Mayer did not include them in their list of information sources to be ranked.

In a study by Granbois and Braden (1976), the extent of information search conducted by consumers was explored to determine if various aspects of search would lead to better predictive accuracy of intentions fulfillment (i.e., purchase). They found greater predictive accuracy when more stores were visited as well as when more discussions with others and within the family were conducted. The number of types of information sources used was not significantly related to predictive accuracy, and the Index of Information Search Activity had only a weak positive relationship with predictive accuracy. Hence, total information-seeking scores may serve to mask important information. The best predictor of information seeking was "expected price to be paid," contrary to the conclusions reached by Newman and Staelin (1972) that price was not related to the information-seeking index.

Granbois and Braden found a positive and significant relationship between social visibility of the product and number of stores visited, optional features considered, types of information sources used, and the Index of Information Search Activity. They found no relationship between satisfaction/dissatisfaction with a previous search and any of the measures of information search. In addition,

they found that as the number of brands considered increased, the predictive accuracy decreased. The authors suggested that higher commitment to purchase may be characterized by consideration of a small set of brands. An inverse relationship was also found between length of planning period and predictive accuracy. The authors suggested that number of brands considered and length of planning period might have been assumed to be indirect measures of search, but they actually might not indicate search behavior at all.

Westbrook and Newman (1978) conducted a study to determine if dissatisfaction among major appliance purchasers and potential purchasers was related to behavioral characteristics of shoppers. Among prospective purchasers, amount of planned information seeking and consultation of neutral sources (i.e., Consumer Reports) were positively related to shopper dissatisfaction. Number of stores visited and advice of friends were not significantly related to shopper dissatisfaction for this group. However, for recent purchasers of appliances, none of the four information search variables mentioned above were found to be significantly related to dissatisfaction. Westbrook and Newman suggested that information search may reflect "other aspects of buyer personality as well as extent of involvement in the decisional task."

Duncan and Olshavsky (1982) studied the relationships between marketplace-related beliefs and prepurchase external

information seeking of color television purchasers. Fifty percent of the variance in the extent of external search was accounted for by 27 consumer beliefs about their capabilities as consumers and about the marketplace. Out of a sample of 164, 36 subjects (22%) reported they exerted no search effort before making a purchase decision. This group was labelled the "nonsearchers," and it was found that their purchases resulted from "previous brand and store experience, unsolicited recommendations from friends and relatives, or personal relationships with retailers."

A search index score with a maximum possible value of 1,000 was utilized, but among the "searchers" in the sample, the average score was 147. Of 27 belief statements, fifteen beliefs had bivariate correlation coefficients significant at the .05 level, and five beliefs had significant multiple regression coefficients. They found that if consumers believed that heavily advertised products were priced higher, then consumers would conduct more search. If consumers believed they were poor judges of mechanical or technical products or believed they were not knowledgeable shoppers, then less search was conducted. If consumers believed that, "When important purchases are made quickly, they are usually regretted," then more search was found to occur. They also discovered that consumers conducted less inter-store search when they believed that local, independent stores offered better service than large chain stores.

In a further analysis, Duncan and Olshavsky found that beliefs relating cues, such as popularity of brand or country of origin, to quality served as brand-limiting beliefs. Store-limiting beliefs focused on the ideas that (1) television sets, in general, require little after-sales service and (2) some stores do indeed provide better service. Hence, it was shown that consumer beliefs will be related to the extent of the external search as well as to the direction of search.

Whirlpool commissioned a consumer attitude study entitled America's Search For Quality (1983). In response to a question regarding trustworthiness of information sources for providing information about manufactured goods, friends, relatives and consumer reporters were rated in that order as being most trustworthy. Advertising ranked sixth out of thirteen sources. Among the advertising media, newspaper advertising was rated the most important source of information, with television, radio, and classified advertising tied for second; magazines, third; and direct mail, last. For major home appliances and home electronics, a family member or friend was reported to be the most reliable information source, followed by a salesperson, and advertising. In addition, it was reported that consumers were most likely to use advertising as a product information source before buying packaged/processed foods and small home appliances. This lends credence to Udell's (1966) findings

of little store search and greater use of out-of-store sources of information.

Cox, Granbois, and Summers (1983) conducted a two-wave survey to investigate planning and search behavior for major household durables and automobiles as well as to determine if search behavior was related to certainty and satisfaction with the purchase. They categorized durable good acquisitions into four categories based on the consumer's present assortment of durables. The four categories are: (1) "Maintenance replacement," (2) "Adjusting/Upgrading Replacement," (3) "Additional Unit Expansion," and (4) "First Acquisition Expansion."

The means of the "number of stores visited" variable ranged from 2.5 for the maintenance replacement category to 3.6 for the additional unit expansion category. The means of the "number of brands considered" variable ranged from 1.97 for maintenance replacement category to 3.21 for the additional unit expansion category. The correlation between the "number of brands considered" and "certainty at time of purchase with respect to the brand" was highly significant. However, the correlation between "number of stores visited" and certainty was not significant when automobiles were removed from the analysis.

In addition, correlation between "number of stores visited," "number of brands considered," and satisfaction was extremely low, indicating no relationship between extent of search and satisfaction. It is interesting to note that

certainty was lowest and satisfaction was highest for those making their first acquisition of a durable type. However, satisfaction with the purchased brand in all categories was found to be high. Thus, search (specifically number of brands considered) may lead to certainty, but search and certainty are not associated with satisfaction with the purchase.

Having discussed the extent of source usage and the relative perceived importance of the sources, it will be enlightening to look at the relative impact of different source types on opinion change and uncertainty. Woodruff (1972) conducted a laboratory experiment involving the choice of a color television set, using marketer-dominated; consumer-oriented, and neutral sources of information. In terms of overall opinion change, two different patterns of source impact were found, depending upon whether mean differences or standard deviation differences were used. Using mean differences, "marketer-dominated sources had the greatest impact, followed by consumer-oriented and neutral sources." However, using standard deviation differences, consumer-oriented sources had the greatest impact on opinion change, followed by marketer-dominated and neutral sources. Each of the sources was tested on its likelihood of reducing uncertainty as well as on its impact on uncertainty reduction. Regarding uncertainty reduction, consumer-oriented sources had the most impact, followed by marketer-dominated sources, and neutral sources. Regarding likelihood

of reducing uncertainty, neutral sources were most likely to reduce uncertainty followed by consumer-oriented sources, and marketer-dominated sources.

The above findings were made from overall tests of each source. However, if one wished to know how influential each source type was with respect to changing opinions and reducing uncertainty about specific product attributes, one would need to measure this for each attribute. Woodruff (1972) found for the attributes of "quality of color reproduction" and "reasonable price" that marketer-dominated sources were most important in changing opinions, followed by consumer-oriented and neutral sources. Also, opinions about "quality of construction of components" were affected most by marketer-dominated sources. Opinions regarding "ability to obtain desirable cabinet" were found to be equally affected by all three information sources.

With respect to uncertainty, "consumer-oriented sources decreased uncertainty more frequently than marketer-dominated sources for three of the four attributes used in this study. Moreover, in a consistent pattern neutral sources decreased uncertainty more frequently than either marketer-dominated or consumer-oriented sources for all the brand attributes" (p. 417). This study has contributed greater depth to an understanding of source usage. Most studies have investigated only which sources were used and their relative perceived importance, but this research went one step further by investigating which sources can be most

influential in changing opinions and reducing uncertainty overall and for specific product attributes.

Another article may provide some explanation as to why consumer-oriented and neutral sources were found to have the highest degree of impact on uncertainty reduction and to be most likely to reduce uncertainty, respectively, in a major durable purchase. Claxton and Ritchie (1979) conducted research to determine what were consumers' major prepurchase information search and information processing problems. For the category of furniture/appliances, four of the most important problems were: (1) "difficulty of judging quality, (2) ignorant sales staffs, (3) poor quality workmanship and materials, and (4) high cost/unavailable parts makes repair unreasonable." Therefore, if consumers do not feel confident in judging product quality, and they have preconceptions of poor quality workmanship and materials, and if they do not feel that retail salespeople are well informed, then they must turn to personal sources (such as friends, relatives, and current users) as well as to neutral sources in order to make a decision.

These prepurchase problems may also contribute to a partial explanation of low inter-store search. Settle (1972) found support for his hypothesis that "Given a very complex product, the consumer will receive more assurance from consensus information provided by an expert other person than from information from other sources." Thus, if the prepurchase problems cited by Claxton and Ritchie are

predominant, then the consumer will often turn to friends or relatives who have expertise regarding the product class or to neutral sources.

Synthesis of Studies Regarding Direction and Degree

Dimensions of Search

The articles just reviewed have shed some light on the direction and degree of consumers' external searches for durable goods. The discussion regarding the direction dimension of external search included information about the types of information and information sources sought and the relative usefulness and impact of various types of information sources. The discussion regarding the degree dimension included information about the extent of external search in terms of measures used, such as number of different sources used, number of stores shopped, and number of brands considered.

The major studies regarding either the direction or degree dimension of external search for durable goods are summarized in Figure 5. The figure points out some of the deficiencies of the external search for durable goods stream of research. Figure 5 clearly shows that most studies have been ex post facto in nature. The figure also illustrates that many studies have investigated only a portion of the search process by looking at very specific parts of the consumer's external search.

Figure 5. Synthesis of major studies regarding direction and/or degree dimensions of search for durable goods.

<u>Author</u>	<u>Type of Study</u>	<u>Type of Product</u>	<u>Dimension of Search Investigated</u>
Katona and Mueller (1955)	Ex Post Facto	Major Household Appliances and Televisions	Direction and Degree
LeGrand and Udell (1964)	Ex Post Facto	Furniture and Televisions	Direction and Degree
Udell (1966)	Ex Post Facto	Small Appliances	Direction and Degree
Kleinmehagan (1966-67)	Ex Post Facto and Observation	Convenience, Shopping and Specialty Goods	Extent of Inter-Store Search
Riter (1966-67)	Ex Post Facto	Color Television	Extent of Inter-Store Search
Dommermuth and Cundiff (1967)	Ex Post Facto	Housewares, Jewelry, and Clothing	Extent of Inter-Store Search
Brandt and Day (1972)	Ex Post Facto	Major Household Appliances and Furniture	Direction and Degree
Newman and Staelin (1972)	Ex Post Facto	Major Appliances and New Automobiles	Direction and Degree
Mason and Hayer (1972)	Ex Post Facto	Television, Clothing, Food and Drugs	Direction and Degree

Figure 5 Continued

<u>Author</u>	<u>Type of Study</u>	<u>Type of Product</u>	<u>Dimension of Search Investigated</u>
Woodruff (1972)	Laboratory experiment	Color Televisions	Direction of Search (as related to opinion change and uncertainty)
Rothe and Lamont (1973)	Ex Post Facto	National and Private Brand Major Appliances	Direction and Degree
Granbois and Braden (1976)	Longitudinal two-wave survey	Major Appliances	Direction and Degree
Westbrook and Newman (1978)	Ex Post Facto and lab study among prospective buyers	Major Appliances	Direction and Degree (as related to dissatisfaction)
Ratchford (1980)	Computer Model	Major Appliances	Degree of Inter-Store Search
Bugan and Olshavsky (1982)	Ex Post Facto	Color Televisions	Direction and Degree (as related to consumer beliefs)
Cox, Granbois, and Summers (1983)	Longitudinal Two-Wave Survey	Major Household Durables and Automobiles	Extent of Inter-Store Search (as related to certainty and satisfaction with purchase)

Whereas these studies have provided greater understanding of consumer search, there is a need to improve on the methodology as well as to enlarge the scope of the research. Tracking studies of the search process would help to address both deficiencies.

Some type of tracking methodology (such as the computer-interactive purchase simulation) would record the dynamic search process as it occurred and, therefore, would not be subject to ex post facto problems of memory loss or inaccurate recall. A tracking study can also be devised to track the entire search process including the use of any number of information sources. Hence, the scope of the research can be widened to include more than just inter-store search or inter-source search.

The next section presents and summarizes the research that has resulted in the development of patterns of information seeking, that is, various combinations of information source usage that constitute differing search strategies.

Patterns of External Information Seeking

Bettman's (1979) third dimension of external search--patterns--is presented only in the context of brand versus attribute patterns of search. While these are certainly important patterns to study from an information processing perspective, there exist other types of search patterns that may provide as much, if not more, insight into external search behavior. Therefore, this section will include

summaries of the literature regarding patterns of external search based primarily on source usage. One will note that the studies of patterns began appearing later in the literature than studies regarding the extent and direction of consumers' searches.

Brandt and Day (1972) identified three patterns of information seeking behavior for durable goods costing over \$100:

1. Non-shoppers were characterized by consumers who considered one brand, shopped in one store, and were less inclined to seek other information.
2. Moderate Shoppers were characterized by consumers who considered two or more brands, shopped at two to three stores, and sought additional information from one or two outside sources.
3. Active Shoppers were characterized by consumers who considered many brands, shopped at four or more stores, and consulted more outside sources.

This early taxonomy of information-seeking behavior provided a framework for later studies of this phenomenon.

Claxton, Fry, and Portis (1974) studied prepurchase information seeking for furniture and appliances, and they developed a more elaborate taxonomy of information gathering patterns that precede purchase decisions. They found three patterns of information seeking for both product classes, which were labelled "thorough-store, intense," "thorough-balanced," and "non-thorough." Thoroughness in search was

related to the number of different sources utilized in the purchase decision-making process.

The "store intense" and "balanced" groups used two or three different information sources on the average while the "non-thorough" group used an average of one source. The "store intense thorough" group seemed to rely more on store visits as an information source, and the authors commented that this group appeared "to shop with their feet." For furniture, this "store intense" group averaged twenty store visits, and for appliances it averaged eight store visits. The "balanced thorough" group averaged four stores visited for appliances and six stores for furniture. However, the "balanced thorough" groups were divided into a slow and a fast group, and the authors indicated a trade-off may occur whereby slower decision makers substituted longer decision times for greater store search. The "non-thorough" group for both product classes basically used one information source, made one store visit, and took comparatively shorter time to make a purchase. Again, this group was divided into slow and fast groups, making the same type of trade-offs between time and store visits.

Comparing the percentage of buyers in each cluster for the two product classes, the "store intense" group comprised 8% of appliance buyers and 5% of the furniture buyers. The "thorough balanced" group represented 27% of the appliance buyers and 44% of furniture buyers, and the "non-thorough" group represented 65% of appliance buyers and 34% of

furniture buyers. Perhaps appliance buyers perceive appliances to be more standardized, and they may feel more confident relying on store or brand reputation, experience, and/or marketing communications. Since furniture is purchased more on its style and color characteristics, is less standardized, is more personal, requires less after-sales service, and may represent the buyer's tastes and personality to others, the more thorough search for furniture by a higher percentage of buyers probably indicates greater involvement due to greater perceived psychological and social risk. Performance is not as important as suitability in furniture purchasing, and suitability may only be judged by inspecting furniture in the store.

With respect to characteristics of consumers using these three patterns of information acquisition, "store intense" buyers had the highest levels of education and income, and "non-thorough" buyers had the lowest. The "store intense" shoppers were most likely to perceive substantial product differences, and financial considerations were of most concern to this group. Both thorough groups were more interested in buying the "right product" than the "non-thorough" group. In addition, the "non-thorough" group was more likely to have an immediate need for the product, probably due to a break-down. The thorough groups were more likely to engage in family discussions, and, for appliances, they were more likely to

buy a product on sale and on the spur of the moment. This study provides some deeper insights into why consumers search to a greater or lesser extent than many of the other studies reported.

Houston (1979) suggested that there might be a generic pattern of source usage for buyers in all product categories, particularly across a set of durable goods. In his study, five different external information sources were rated on their usefulness in evaluating five different durable goods on five different product attributes. In addition, subjects were also asked to rate the importance of the product attributes for each of the five durable good product categories (televisions, refrigerators, washers, stereos, and can openers). He found that dealer visits were most useful in providing information about style, price, and extra features; and other persons were most useful for providing information about durability and dealer reputation. Based on these results, Houston (1979) inferred:

Given the consistency across product classes of the importance of durability, price, and dealer reputation, and given in-store evaluation of these attributes, consumer usage of other persons for information on durability and dealer reputation, of product rating publications for durability, of information brand rating publications for list prices, and of dealer visits for actual prices would seem to be a likely

source usage pattern for buyers in all product classes
(p. 143).

Westbrook and Fornell (1979) utilized three measures of information source usage (number of retail stores visited and intensity of neutral source usage and personal source usage) in an attempt to construct patterns of information source usage among buyers of major household appliances. Respondents were asked whether they used each source, how many retail stores were visited (intensity of usage) and whether the neutral and personal sources were their main source (intensity). Below are four patterns (segments) of source usage resulting from this study:

Pattern I - "Objective Shopper": characterized by "high level of retail visits and considerable reliance on neutral information sources to the exclusion of personal sources." Explanatory variables found to be significantly related to this segment: higher education and consideration of many alternative brands.

Pattern II- "Store Intense Shopper": characterized by an "even greater degree of retail search than objective shoppers, but lesser reliance on neutral sources of information and greater consultation of personal sources." Explanatory variables found to be significantly related to this segment: older and consideration of many alternative brands.

Pattern III-"Personal Advice Seeker": characterized by visits to "relatively few retail outlets and rely primarily

on personal advice from friends and neighbors; few of these buyers consult neutral sources." Explanatory variables found to be significantly related to this segment: youngest and most likely to consider many alternative brands.

Pattern IV- "Moderate Shopper": characterized by the fewest visits "to retail stores on the average, and even though more than half have consulted neutral sources, they rely primarily neither on the latter nor on personal sources." Explanatory variables significantly related to this segment: least education, least likely to have considered many brands, and very likely to have an urgent need for replacing an item.

There are similarities between this taxonomy and the one proposed by Claxton, Fry and Portis (1974). For example, both use the store intense category. The "Objective Shopper" described in this study might be best compared to the "Thorough-Balanced" category in the Claxton, Fry, and Portis study. The "Personal Advice Seeker" and "Moderate Shopper" categories of this study may be most similar to the "Non-shopper" category in the 1974 study.

Kiel and Layton (1981) studied three dimensions of external information seeking (sources of information, time, and brand) of new car buyers. They reported that 36% of the car buyers made two or fewer visits to dealers, while 20% of the buyers made six or more visits. (Note: this is trips made, not necessarily number of different dealers visited). Factor analysis was conducted on the search variables,

yielding four factors: retailer search, media and deliberative search, interpersonal search, and a time dimension (search and introspection). Cluster analysis then enabled the researchers to classify consumers into three groups based on patterns of search. Profiles of these three groups are presented below:

"Low Information Seekers" (24% of sample): characterized by little search among all information sources, few dealer visits, few discussions with others regarding purchase, little use of the media, purchased more quickly and with little brand or dealer deliberation.

"High Information Seekers" (19% of sample): characterized by extensive use of all information sources, deliberate on several brands and dealers, spend considerable time making purchase decision.

"Selective Information Seekers" (57% of sample):

Group 1 (31%): characterized by high retailer search and low levels of usage of other information sources.

Group 2 (13%): characterized by low retailer search and extensive use of interpersonal sources of information.

Group 3 (13%): characterized by intermediate amount of retailer, interpersonal, and media search, considerable search and decision time, and little brand or retailer deliberation.

Furse, Punj, and Stewart (1982) used cluster analysis to identify five information-seeking strategies/patterns in

automobile purchasing. These search patterns will be presented below:

1. "Constructive Shopper": characterized by the most extensive search (both in-store and out-of-store), most likely to have more than one household member participating in the purchase, least likely to be confident of making a good purchase before search, least satisfied with previous car and less likely to know what dealer or manufacturer they would buy from, more likely to be married, to have children at home, and to read consumer magazines (11% of sample).

2. "Surrogate Shopper": characterized by above-average search, very likely to have more than one household member involved in the purchase decision making, expected to pay the least for new car, less satisfied with previous purchase, less likely to know what dealer or manufacturer they would buy from in advance, above-average search results from long hours of search by other household members.

3. "Preparatory Shopper": characterized by proportionately more out-of-store search than in-store search, most likely to be single and have no children, less likely to have help from a household member, not likely to know from which manufacturer or dealer purchase will be made, more likely to be satisfied with last car purchase, most likely to read consumer magazines.

4. "Brand Loyal Shopper": characterized by being most likely to know from which manufacturer the purchase would be made, spend less than average amount of time in out-of-store

search, more likely than the first three search patterns to be satisfied with previous car purchase, more likely to be married than not, more likely to be joint purchase decision, and less likely to read consumer magazines.

5. "Routinized Response Shoppers": characterized by below average search of all types, similar to Bettman's pre-processed choice in that buyer is most likely to pre-specify both the make and the dealer, most likely to be satisfied with previous purchase, most likely to be over 55 years old and very likely to live alone, and more likely to expect to pay the highest price for a car.

The authors suggested that these five patterns could be classified according to the degree of problem solving exhibited. They stated that the "Constructive Shopper" appeared to be involved in extensive problem solving, while the "Routinized Response Shoppers" exhibited the type of problem-solving behavior suggested by their name. The "Surrogate," "Preparatory," and "Brand Loyal" shoppers were described as evidencing some amount of limited problem solving behavior. Finally, the results of this study provide no support for the contention that search behavior is related to education or income level.

While Midgley (1983) conducted a study of patterns of interpersonal information seeking in men's suit purchasing, he was looking at information seeking for socially symbolic products. He found five patterns of information seeking,

which are summarized below:

1. "Minimal External Search: Deliberate": not influenced much by interpersonal information, use store assistance, but conduct little inter-store search.
2. "Peer-Assisted Search": influenced by peer group norms, discussions with others and visual influence of others, shop alone, do not rely on store personnel, and conduct little inter-store search.
3. "Extensive External Search": extensive physical shopping, shopper accompanied by a woman.
4. "Spouse-Assisted Search": less deliberation and prespecification, less influence of group norms, rely on store personnel as well as on spouse.
5. "Minimal External Search: Decisive": not influenced much by interpersonal sources, little use of store personnel, visits more outlets than "Deliberate" and better guided by group norms, less deliberation and prior specification.

In relating individual types to information-seeking patterns, Midgley found that uninvolved individuals were most likely to use the "Minimal External Search: Deliberate" pattern; that singles were most likely to use the "Peer-Assisted Search" pattern; that people interested in fashion were most likely to use the "Extensive External Search" pattern; and that people in high status positions were most likely to use the "Minimal External Search: Decisive" and "Spouse-Assisted Search" patterns of information seeking.

While the purposes of this study were different from Kiel and Layton's (1981), one can see similarities between Kiel and Layton's five patterns of information seeking (low, high, and selective) and Midgley's five patterns.

The Whirlpool study (America's Search For Quality, 1983) reported that consumers use a variety of information sources, but factor analysis revealed that four groups relied primarily on one source each (advertising, television and radio shows, friends and relatives, or consumer interest media). Those who relied primarily on advertising for product information (10% of sample) also relied on, and were more demanding of, store personnel. Members of this group were more likely to disagree that quality products are more expensive. Guarantees and warranties were perceived to be more important to this group than to other groups before purchasing.

Consumers who relied primarily on television and radio shows for product information (13.5% of sample) were most likely to perceive themselves to be better informed consumers than they used to be. They also are most likely to believe that if you want quality, you have to pay more for it. Hence, this group may be well informed, but may rely on price to indicate quality in a purchase decision. The consumer group which relied primarily on friends and relatives for product information (41% of sample) was least likely to rely on sales personnel and demand that they be knowledgeable. Members of this group were least likely to

check on a product's warranty/guarantee before purchasing and were least likely to believe they were better informed shoppers than they used to be. It would seem that members of this group have abdicated the decision maker's role, and they rely heavily on a friend or relative. Finally, those who relied primarily on the consumer interest media (35% of sample) were more interested in the safety of products and were more likely to say they were more demanding consumers than they were a few years ago. They were also likely to rely to an extent on store personnel. Hence, the consumer interest media reliant group may have either different or additional informational needs that are best addressed by the consumer interest media.

Consistent with the reliance on mainly one information source by each of the four groups is the feeling by 70% of the respondents that "they often feel they are not getting their money's worth," and some appear to blame themselves for not shopping around enough. Finally, 80% of the sample said, "there was too much product information available, and 63% said this makes it harder to choose products." For the latter statement, agreement was negatively associated with the respondent's education. The concept of information overload is apparently at work.

While much of the previous literature presented has focused on findings that many consumers conduct fairly little external search for information, Thorelli and Engledow (1980) have profiled a group of consumers who are

avid information seekers and who subscribe to consumer testing magazines. They refer to this group as "Information-Sensitive Consumers." In addition, they have found that this group is present in three industrially advanced countries--the U.S., Norway, and West Germany--and is significantly different from the average consumer group. The profile of this group is as follows. "Information-Sensitive Consumers" are characterized as being well educated, most likely to hold professional or managerial positions, with incomes well above the mean, and possessing a large assortment of durable goods. They exhibit their sensitivity to information through their greater-than-average media usage (especially print media), their high interest in purchase decision making and in market information problems generally. They place great confidence in product tests and other sophisticated sources of information, and they hold "high expectations and performance standards for products" (p. 12).

Thus, "Information-Sensitive Consumers" possess greater intelligence, which enables them to utilize diverse information sources and to integrate this information with their own extensive purchasing experience in order to produce a greater number of evaluative criteria. Not only do they have the ability to conduct a thorough external search, but they have the interest to search for information from various sources. In Hirschman's (1980) terms, they possess a high "interconcept network density," large

"situational repertoires," and they exhibit "novelty-seeking behavior." As a result, they are able to make better purchase decisions. In addition, the authors note that "there seems, in general, to be a snowballing effect to education, experience, and information usage," (p. 18) and they found that greater experience in purchasing was related to greater information search.

Thorelli and Engledow (1980) summed up the average consumer's problems in this way:

The consumer has more money, and hence more choices to make, more alternatives per choice, an increasing "price" on personal shopping time, and higher personal standards to meet on each outcome. Added to these is the fact that personal input may be losing value, both because experiences with products quickly become obsolete with rapid product change, and there tend to be fewer, less well-informed salespeople involved in current retailing methods" (p. 10).

The result is what the authors call the "consumer information gap." When the purchasing problem is seen from this viewpoint, one can easily understand why many consumers will be overwhelmed and will consequently purchase as expeditiously as possible.

Finally, one study reported that the first source used in the information search process influenced later search and was related to the type of store where the purchase was ultimately made. Wilkie and Dickson (1985) reported the

following relationships between information source used first and type of store where purchase was made:

- Consumer Reports, 81% purchased at specialty stores.
- Repairpersons, 73% purchased at specialty stores.
- Salespersons, 63% purchased at specialty stores.
- Friends/relatives, there was no significant difference.

- Newspaper ads, 61% purchased at Sears.
- Catalogs, 72% purchased at Sears.

This is the only study found that discussed sequence of search and found earlier source usage to influence later source usage. Furthermore, the authors indicated that consumers exhibiting different search sequences would be interested in different marketing mixes (p. 28).

Synthesis of Studies Regarding Patterns of External Search

This completes the review of the literature section with respect to patterns of external search for durables. These studies are summarized in Figure 6, and the figure reveals further weaknesses in this stream of research. First, most of the group of studies gathered data from subjects after they had purchased something in the product category being investigated. Tracking studies were not evident; and when one wishes to learn more about the prepurchase search process, it is more desirable to record the search as it is occurring rather than retrospectively. Thus, a process methodology is more appropriate for examining information seeking behavior than are

Figure 6. Synthesis of studies of information-gathering patterns for durable goods.

Author	Type of Study	Type of Product	Dimension of Search Investigated
Brandt and Day (1972)	Ex Post Facto Multiple Regression	Major Household Appliances and Furniture	Direction, Degree, and Patterns Non-shoppers Moderate Shoppers Active Shoppers
Claxton, Fry and Pórtis (1974)	Ex Post Facto Cluster Analysis	Major Appliances, Televisions, and Furniture	Direction, Degree, and Patterns Thorough (Store Intensive) Thorough (Balanced) Non-Thorough
Houston (1979)	Ex Post Facto Analysis of Variance	Televisions, Appliances, Stereos	Direction of Search and Suggested Generic Pattern of Source Usage for Durable Goods
Westbrook and Fornell (1979)	Ex Post Facto Canonical Correlation	Major Household Appliances	Direction, Degree, and Patterns: Objective Shopper Store Intensive Shopper Personal Advice Seeker Moderate Shopper
Kiel and Layton (1981)	Ex Post Facto Factor and Cluster Analysis	New Automobiles	Direction, Degree, and Patterns: Low Information Seekers High Information Seekers Selective Information Seekers
Purée, Punj and Stewart (1982)	Ex Post Facto Factor and Cluster Analysis	New Automobiles	Direction, Degree, and Patterns: Constructive Shopper Surrogate Shopper Preparatory Shopper Brand-Loyal Shopper Routinized Response Shopper

Figure 6 Continued

Author	Type of Study	Type of Product	Dimension of Search Investigated
Midgely (1983)	Ex Post Facto Cluster Analysis	Men's Suits	Direction, Degree, and Patterns: Minimal External Search: Deliberate Peer-Assisted Search Extensive External Search Spouse-Assisted Search Minimal External Search: Decisive
America's Search for Quality (1983)	Opinion Survey Factor Analysis	Consumer Manufactured Goods and Services	Direction, Degree, and Patterns: Primary Reliance on either: Advertising, TV and Radio Friends and Relatives Consumer and Interest Media
Thorelli and Engledow (1980)	Ex Post Facto Descriptive Profile	Shopping for Goods in General	Direction and Degree Profile of Information-Sensitive Consumers

methodologies that try to capture the process after it has occurred.

Although most of the studies summarized in Figure 6 resulted in three to five information seeking patterns, these patterns represent only the direction and degree dimensions of search. Only one of the studies investigated the sequence in which information sources were utilized or the sequence in which information was acquired. Hence, the patterns reported in these studies reflect only the use of different combinations of information sources (direction and degree), but do not reveal the full story about external information seeking since the sequential order of source usage is not known or included in the search patterns.

The sequence in which information sources are used can be important information for the marketer. For example, the position of an information source within a search sequence may determine the other sources and types of information required by the consumer.

By incorporating search sequences into the search patterns, the marketer will have a richer understanding of the most common search strategies. These more comprehensive search patterns can then serve as a basis for market segmentation. The more the marketer knows about the different market segments, the better the market segments can be served via better communications, distribution channels, products, and services.

Furthermore, if new studies are able to result in similar information-seeking patterns to those already reported in the literature and they are also able to add the sequence dimension to the pattern, then further evidence will be provided for the pattern and new information will be added to the field.

Summary

Consumer search behavior is an important and integral part of each of the comprehensive models of consumer behavior. Since prepurchase information seeking is particularly relevant to durable and shopping goods, these terms were discussed and a model of major durable goods acquisition was presented.

Bettman's (1979) framework for investigating external search was used to categorize the recent literature by dimension of search studied. Those studies that reported on direction and/or degree of search were reviewed first. The major limitations of this stream of research stemmed from the ex post facto nature of the studies and the limited scope of the studies with respect to the prepurchase information-seeking process. A methodology is needed that tracks the entire process as it occurs.

The patterns of external information-seeking for durable goods that have been reported in the literature during the 1970s and 1980s were also reviewed. The major weakness of this stream of research stems from the fact that the patterns of search reported have merely been new

combinations of the degree and direction dimensions of search. In order to make a truly novel contribution to the literature, what is needed is the introduction of new information (that is, sequence of source usage information) to the pattern development process, instead of the recombination of old information.

CHAPTER III

THE RESEARCH AREA AND RESEARCH QUESTIONS

Introduction

This research is exploratory in nature. Numerous research studies have been reported in the literature regarding the extent of consumers' external searches, the relative importance of information sources, the mixes of information sources used, and the patterns of information acquisition/processing used with respect to brand and attribute. However, very little research has focused on the sequential patterns of external search exhibited by consumers of durable goods. In particular, the proposed research will investigate the sequences in which consumers seek out information sources during prepurchase external search. The emphasis in this research is on sequences of information source usage, while the emphasis in other research has been on sequences of brand and/or attribute information acquisition (Bettman, 1979).

Theoretical and Empirical Support for

Research Question One

The major focus of this research is on the research question: Are distinctly different sequential patterns of information source usage exhibited by consumers during prepurchase information search for durable goods? In order to address this question, it is important to first discuss why we would expect to find patterns in external search behavior rather than random search behavior. Subsequently,

further evidence will be provided to support the expectation of distinct search patterns.

External Search is Not Random Behavior.

The support for the non-randomness of external search will be presented now. Simon (1957) told the story of an organism which had only one need--food--and which lived in an environment in which food piles were distributed randomly. He stated, "Since the food heaps are distributed randomly, there is no need for pattern in its searching activities" (p. 263). However, Simon also states "that the organism's modest capacity to perform purposive acts over a short planning horizon permits it to survive easily in an environment where random behavior would lead to rapid extinction" (p. 265).

Unlike this simple organism's environment, the consumer's environment of information sources is not randomly distributed and, therefore, the development of search patterns would lead to more efficient information acquisition. The consumer does not need to develop a new search strategy each time a purchase task arises. If the consumer did, s/he would spend a disproportionate amount of time in prepurchase search and decision making. Instead, the consumer may recall partial or complete purchasing strategies that have been used in prior purchase situations, thereby enabling the consumer to simplify the purchasing task. It is possible, therefore, that very young consumers would exhibit impulsive and random search behavior because

they are not familiar with the types of information sources available to them. However, by the time one becomes an adult, one would be expected to have learned about a variety of information sources.

In addition, Burnkrant (1976) states that consumers will be more motivated to acquire and process information if the information is: (a) relevant to an aroused need for information (need), (b) perceived to be positively valued as an information need satisfier (value), and (c) believed or expected to have a high probability of satisfying an information need (expectancy).

Given the above, Burnkrant suggests that humans develop a "belief-value matrix," which contains images of objects that one has learned are relevant to the satisfaction of an aroused need for information. Hence, when purchasing tasks arise that are similar to past purchase situations, the consumer chooses information sources from his/her "belief-value matrix" that have the highest probability of satisfying an information need. Burnkrant posits that humans process information to satisfy a need for uncertainty change.

However, if one does not perceive this need for information/uncertainty change, then the "belief-value matrix" will probably not be called into action. This may occur if the consumer perceives the purchase to be habitual and exhibits routinized response behavior or it may occur if the consumer is acting randomly. While young or

inexperienced consumers may not possess a complete "belief-value matrix," most adult consumers would be knowledgeable about the existence, usefulness, and value of purchase information sources and would, therefore, possess a fairly complete matrix.

While many researchers might argue that patterns of search for durable goods would not be developed by consumers because long inter-purchase intervals would lead to pattern forgetting, Mueller (1955) reminds us that habits (patterns of behavior) may result from reinforcement as well as from repetition. Hence, the consumer who is well served by a durable good for many years is constantly reminded over the life of the product that he or she shopped wisely and used a good purchasing strategy. That consumer may be more likely to re-enact the same pattern or segment of that pattern when a similar purchase situation arises.

Bauer's work (1960) on perceived risk also lends support to the argument that consumers' external information searches are not random. He suggests that consumers develop strategies for dealing with perceived risk, strategies which may determine which types of information sources will be utilized. For example, consumers who favor and purchase advertised brands in an effort to reduce risk probably rely heavily on advertising as an information source and may use few other information sources. Consumers who use an opinion leader's advice to reduce perceived risk may rely very little on commercial information sources. Consumers who

reduce perceived risk by buying the most inexpensive brand will probably rely heavily on price advertising and store search. Consumers who use brand loyalty as a risk-reduction strategy may restrict their information search to those stores carrying the preferred brand. Reliance on store reputation and store loyalty may be used as strategies to reduce uncertainty and risk regarding product quality; in addition, these strategies also allow the consumer to limit external search (Stigler, 1961). Consumers may routinely use particular search and decision-making strategies in situations involving the perception of similar types and amounts of risk. Hence, for products evoking similar perceptions of risk (such as major household appliances), consumers may put into action similar search sequences.

Hawkins and McCain (1979) conducted a study which resulted in the description of several shopping strategies for four different shopping goods. While most of the shopping strategies were characterized by purposive or systematic behavior, one strategy was labelled "completely random shopping." The researchers described this strategy as "inefficient" and stated that "it is unlikely that it is utilized frequently in the real world" (p. 69). However, it was also pointed out that even this inefficient strategy would return benefits to the consumer for more expensive products and may be better than no shopping at all.

The above is evidence to support the proposition that the external search for durable goods by most consumers is

not random. Evidence that there exist distinct mixes of information source usage and that different degrees of search are possible will now be presented. It will be used to support the contention that there exist distinctly different sequential patterns of information source usage.

External Search: Purposeful and Patterned

Howard and Sheth (1969) appear to be the first to have classified consumer problem solving on the bases of degree of external search and amount of decision time. A decision process characterized by routinized response behavior requires little or no external search and takes little time. At the other extreme, extensive problem solving is characterized by extensive external search and the longest decision time. Between RRB and EPS is limited problem solving, which is characterized by an intermediate amount of external search and decision time. While this theory suggests that consumers who perceive a problem similarly will conduct external searches of similar degree, it also implies that consumers will perceive the same purchase differently as purchasing experience is gained in a product class (Lehmann, Moore & Elrod, 1982). Hence, this theory provides some support for the notion that consumers' external searches may vary in degree and that different consumers may perform similar searches.

Smith (1970) presented four explanations of durable good choice behavior based on direction of search as well as on choice of risk-reduction strategy. Brandt and Day (1972)

were able to classify consumers' information-seeking behavior into three groups based primarily on extent of search. Claxton, Fry, and Portis (1974) studied both appliance and furniture prepurchase information seeking and identified three patterns of information search based on degree, direction, and length of search. Moschis (1976) described six types of shoppers (special, brand-loyal, store-loyal, problem-solving, psychosocializing, and name-conscious shoppers) and discussed the types of information sources with which each shopper type was most highly correlated. Westbrook and Fornell (1979) studied major household appliance purchasing behavior and found four patterns of source usage based on the extent of usage of three source types--store visits, neutral sources, and personal sources. Kiel and Layton (1981) classified automobile buyers into three groups based on extent and direction of search.

Hauseisen (1981) developed a typology of five consumer types based on their propensities to shop and preferences for certain types of stores. Information sources other than retail stores were not included in this study. The Whirlpool study--America's Search for Quality (1983)--reported that, while consumers may use more than one information source, they often rely primarily on one source of information. Finally, Thorelli's and Engledow's (1980) profile of the "information sensitive consumer" describes one type of consumer who is most likely to utilize

information from a wide variety of information sources before making a purchase decision.

Hence, this group of studies illustrates that consumers do actually differ in their information seeking behavior and can be grouped into a small number of distinct categories based on the degree and the direction of their external searches for information.

Bettman's (1979) conceptualization of external search includes a "patterns" dimension in addition to the "direction" and "degree" dimensions. This "patterns" dimension is dissimilar to the patterns of search that are often discussed in the consumer behavior literature. Sometimes, the term "patterns of search" will be used to describe mixes of information sources used by consumers. These mixes may provide information about the direction and degree of information search, but do not indicate in which order information sources are accessed. On the other hand, Bettman's "patterns" are based primarily on whether the consumer seeks information by brand, by attribute, or by switching between the two using a phased strategy. Using this definition of "patterns," one would measure the type of information acquired as well as the sequence in which it was acquired.

Jacoby et al. (1977) identified five search patterns, that began with either the choice by processing attributes (CPA) or choice by processing brands (CPB) strategy and which possessed different probabilities for four types of

transitions. Building upon these four transition types, Capon and Burke (1980) formulated nine different information acquisition strategies. They used CPA, CPB, and CFP (choice by feedback processing) as master categories with subcategories representing extent of search among available brands. Only eight percent of the subjects in this study could not be classified as using one of the nine strategies, therefore, they were placed in a random processing strategy. These random processors were predominantly of low socioeconomic status.

It has been shown that external information seeking is not likely to be a random activity for most consumers. In addition, research results have shown that consumers can be categorized by similarities in their information-seeking behavior. Some studies categorized consumers' external searches by degree and/or direction of search. They reported that some consumers' external searches were longer than others; some consumers' external searches include different combinations of sources; and some consumers' external searches involve more extensive use of particular information sources. Other studies have found that consumers do exhibit similarities in their information acquisition sequences. Given that consumers of durables have been found to exhibit different, distinctive external searches with respect to the direction, degree and patterns dimensions, it is reasonable to hypothesize that consumers

can also be grouped according to sequential use of information sources.

Research Question Number One: Will consumers exhibit a small number (fewer than ten) of distinctly different sequential patterns of information source usage (external search) prior to purchase decision making for durable goods?

Theoretical and Empirical Support for

Research Question 1a

Do some information sources typically lead consumers to certain other information sources? Stated another way, is the probability of use of some information sources higher after the use of certain other information sources? This appears to be a relatively unexplored area. Intuitively, one could make some reasonable predictions regarding the sequential use of information sources. For example, the consumer who reads newspaper advertisements may be led to visit a retail store next. In many instances a retail store visit may prompt the consumer to consult with friends and relatives before making the purchase decision.

Conversely, the use of some information sources may reduce the likelihood of using other information sources. Katona and Mueller (1955) suggested that consumers who used friends or relatives as an information source were more likely to consult other sources, too. On the other hand, consumers who did not consult friends or relatives were also less likely to use other information sources. Arndt and May (1981) found some support for the proposition that

inexperienced consumers would be less likely to use advertising as an information source if they had previously acquired word-of-mouth information, and they would be more likely to use advertising as an information source if they had not previously acquired word-of-mouth information.

Rethans and Taylor (1982) have studied consumer behavior, and suggest that consumers develop "shopping scripts" as a result of purchase experience. These scripts include a blueprint for a sequence of prepurchase, purchase, and post-purchase activities. Lakshmi-Ratan and Iyer (1986) contend that the script is formed as a result of multiple occurrences; that it provides the consumer with an action sequence of a behavioral situation and an information processing framework, which facilitates interpretation of information. They have developed a model for analyzing consumer scripts.

If these scripts are applicable to a range of purchases (i.e., not product-specific), then it is reasonable and logical to expect that consumers make somewhat general plans for their prepurchase behavior. Furthermore, it is also reasonable to expect that some sources will be found earlier in these scripts before other types of sources. Rogers' (1962) work on diffusion of innovations would lead one to predict the use of mass media advertising sources during the early stages of the adoption process and interpersonal (word-of-mouth) sources during later stages in the adoption

process. Based on the aforementioned evidence, a corollary to Research Question One will be presented.

Research Question 1a: Given the use of an information source in the prepurchase external search sequence, will other sources possess varying probabilities of occurring next in the sequence?

Theoretical and Empirical Support for

Research Question 1b

If Research Question number one is supported and there appear to be distinct types of external search sequences, then it is important to attempt to determine why consumers exhibit different search sequences. Several demographic, socioeconomic, and psychological traits have been included in this study because they have been found to be related in some way to external search behavior. These consumer traits are presented in Figure 7 along with their theorized or empirical relationships with external search.

Figure 7 reveals that the following variables have been shown to have a positive relationship with information search: unmarried status, greater education level, ownership of a car/vehicle, greater product-class knowledge, greater importance of purchase or concern for optimality, greater perception of inter-brand diversity, greater enjoyment of shopping and greater perception of the importance of economizing.

The following variables have been shown to possess an inverse relationship with greater external search: presence

Figure 7. Relationships between consumer variables and extent of information search

<u>Variable</u>	<u>Relationship with Search</u>	<u>Study</u>
Sex of Consumer	Results mixed Women shopped more than men for durable goods. No Relationship found between search and sex.	Newman and Staelin (1972) Kiel and Layton (1981)
Age of Consumer	Results Mixed Consumers aged 21-44 were more likely to be active information seekers. Those 55 and older conducted little or no information seeking. Inverse relationship between age and extent of search.	Katona and Mueller (1955) Schaninger and Sciglimpaglia (1981) Phillips and Sternthal (1977) Newman and Staelin (1972) Hempel (1969) Udell (1966) Westbrook and Fornell (1979)
Marital Status	Older consumers exhibit the most inter-store search. + Relationship between singles and search. Young, unmarried consumers had highest information-seeking scores. Marital Status affected use of different sources.	Newman and Staelin (1972) Udell (1966)
Presence and Age of Children	Results Mixed No difference in circumspectness between young couples with and without children, but more active information-seekers among young couples with children. Value of time will be greater for families with young children.	Katona and Mueller (1955) Granbois (1971)

Figure 7 continued

<u>Variable</u>	<u>Relationship with Search</u>	<u>Study</u>
Household Income	Results Mixed	
	Middle-income consumers searched the most;	
	high-income consumers searched somewhat less;	Katona and Mueller (1955)
	low-income consumers performed little or no	
	information seeking.	
	Middle-income consumers exhibit most	Newman and Staelin (1972)
	external search.	
	Higher-income households evidenced greatest	Claxton, Fry and Portis (1974)
	amount of search.	
	Information-sensitive consumers earn income	Thorelli and Engledow (1981)
	25% above the mean and are in upper middle	
	class.	
	Retailer search inversely related to income.	Kiel and Layton (1981)
	No support that search behavior is related	Furse, Punj, and Stewart (1982)
	to income.	
	Major cost of search is time and time is	Stigler (1961)
	most valuable to those with higher incomes.	
Car Ownership	+ Relationship between car ownership and search.	
	Consumers visited more stores when costs of	Bucklin (1966)
	traveling were lower.	
	Consumers without cars are limited geograph-	
	ically as to where they shop and will not	Block (1972)
	acquire as much dealer information.	
Product-Class Knowledge	+ Relationship between Product-Class Knowledge	
	and search.	
	Consumers with greater initial knowledge of	Katona and Mueller (1955)
	what is available conducted more active	
	external searches.	
	Consumers with moderate levels of product-	
	class knowledge and purchasing experience	Bettman and Park (1980)
	conducted more extensive searches than	Park and Lessig (1981)
	consumers with more or less knowledge.	
	Consumers who possess the greatest amount of	Stigler (1961)
	information will also conduct the most extensive	
	searches.	

Figure 7 continued

Variable	Relationship with Search	Study
Level of Education Completed	<p>+ Relationship between education and search: Deliberateness and extent of search increased with education level. Also supported by other studies.</p> <p>Consumers with high school or bachelors degrees searched more extensively than those with less than a high school education, college drop-outs, and those with advanced college degrees.</p> <p>Information sensitive consumers who search more are most likely to have bachelors or graduate degree.</p> <p>Consumers with more education conduct more information seeking except among retailers. Persons with slower information processing capabilities may compensate by spending less time acquiring information.</p> <p>No support that search behavior is related to education level.</p>	<p>Katona and Mueller (1955)</p> <p>Udell (1966)</p> <p>Claxton, Fry and Portis (1974)</p> <p>Westbrook and Fornell (1979)</p> <p>Schaninger and Sciglimpaglia (1981)</p> <p>Newman and Staelin (1972)</p>
Number of Adult Wage Earners in Household	<p>Inverse relationship between working wife and search. Working wives engage in less search for prepurchase information.</p>	<p>Thorelli and Engledow (1981)</p> <p>Kiel and Layton (1981)</p> <p>Lanzetta and Kanareff (1962)</p> <p>Furse, Punj, and Stewart (1982)</p> <p>Schaninger and Sciglimpaglia (1981)</p>

Figure 7 continued

<u>Variable</u>	<u>Relationship with Search</u>	<u>Study</u>
Perception of Diversity between Brands	<p>+ Relationship between inter-brand diversity and search. Decisions involving alternatives that are difficult to distinguish among present greater costs than benefits and lead to less information search. Choice is more difficult in product classes with greater variability and no dominant brand. Greater perceived heterogeneity among brands is positively related to greater external search.</p> <p>Lack of ability to perceive differentiation among brands was negatively associated with search.</p>	<p>Pollay (1970)</p> <p>Shugan (1980)</p> <p>Cox and Rich (1964) Kaish (1967) Granbois (1971) Claxton, Fry and Portis (1981) Schaninger and Sciglimpaglia (1981) Duncan and Olshavsky (1982)</p>
Perception of Diversity between stores	<p>- Relationship between inter-store diversity and search. Belief that there are significant differences between stores is negatively related to inter-store search.</p>	<p>Duncan and Olshavsky (1982)</p>
Enjoyment of Shopping	<p>+ Relationship between shopping enjoyment and search. Consumers who enjoyed shopping were more likely to conduct more extensive searches.</p>	<p>Katona and Mueller (1955) Kiel and Layton (1981)</p>
Brand Loyalty	<p>- Relationship between brand loyalty and search Consumers who were satisfied with a previous article conducted less information searching. Brand loyalty was related to the attribute processing search sequence.</p>	<p>Katona and Mueller (1955) Jacoby et al. (1977)</p>

Figure 1 continued

<u>Variable</u>	<u>Relationship with Search</u>	<u>Study</u>
Store Loyalty	<p>- Relationship between store loyalty and search Previous experience with a store was negatively related to information search.</p>	Brandt and Day (1972)
Perception of Importance of Economizing	<p>+ Relationship between importance of economiz- ing and search. Concern over price is positively associated with greater information search.</p>	<p>Katona and Mueller (1955) Brandt and Day (1972) Newman and Staelin (1972) Rothe and Lamont (1973) Claxton, Fry, and Portis (1974)</p>
Perception of Importance of Brand Reputation	<p>Relationship not clear Brand reputation was most important factor in the selection of major appliance.</p>	Kaiden (1960)
Perception of Importance of Store Reputation	<p>Relationship not clear Character of store was most important factor in trade-off analysis involving household durable goods purchasing. Dealer reputation was more important factor for more expensive durable goods.</p>	<p>Claxton and Ritchie (1979) Kaiden (1960)</p>

of working wife, possession of greater product-specific purchasing experience, perception of more inter-store diversity, greater brand loyalty, and greater store loyalty.

The literature regarding the following variables does not show consistent information or provide sufficient information to hypothesize a direction of relationship with search behavior: sex and age of consumer, presence of children, household income, product specific self-confidence, and perception of importance of store and brand reputation.

In light of the evidence provided in Figure 7 supporting certain relationships between individual variables and external search, the following research question can be posed.

Research Question 1b: Is the use of different sequential patterns of external search for a durable good related to one or more demographic, socioeconomic, and/or psychological variable(s) in the expected direction (as summarized in Figure 7)?

Theoretical and Empirical Support for

Hypothesis Number One

It will be emphasized again that this research is exploratory in nature. Since quite a lot of information is known about the direction and degree of prepurchase external search but very little is known about the sequence of external search, the hypotheses stated here are backed by a limited amount of theoretical and empirical support.

Consumers must begin their external information searches somewhere, but how do they decide where to begin? Given that consumers normally retrieve information from internal memory before embarking on an external search, one might hypothesize that consumers acquire information that is easier to acquire before acquiring other information. Leigh (1983, p. 677) suggested that researchers consider alternative conceptualizations of source usage, including grouping sources by "ease of accessibility." Beales et al. (1981) discussed information acquisition in a cost-benefit context. Included in their category of external information sources were: direct inspection by the consumer, seller-related sources, and disinterested third parties.

Seller-related sources were described as being the least costly external source for consumers (in terms of effort). Information from seller-provided sources is most likely to be acquired casually, that is, while the consumer is engaged in another activity (Walters, 1978). In contrast, other types of information sources are usually sought after purposefully. The seller-related source category may include advertising and personal selling.

The direct inspection category, which involves prepurchase observation by the purchaser, probably falls somewhere in between seller-related sources and disinterested third parties in terms of ease of information acquisition. Direct inspection requires more physical effort than the utilization of seller-related sources.

Direct inspection may be as costly as using a disinterested third party in terms of cognitive effort, but may be perceived as having a lower total cost because there are no direct financial outlays required. The disinterested third party category, which includes paid consultants and Consumer Reports-type publications, involves the highest and most tangible costs. In addition, Beales et al. (1981) stated that since seller-supplied information is "readily available and is often obtained with little cognitive effort, there is sometimes little incentive for consumers to seek out other, more neutral information sources" (p. 20). Using this conceptual framework as a guideline, the first hypothesis will be stated:

Hypothesis Number One: Information from information sources that are perceived as being the least costly (in terms of effort) will be acquired first during the consumer's external search.

Theoretical and Empirical Support for Hypothesis Number Two

A different conceptual framework involving the value of information sources within a decision-specific context will now be discussed. Consumers may believe that some information sources provide better, more useful information with which to make a specific decision than other information sources. Burnkrant's (1976) "belief-value matrix" is evidence of this viewpoint. The consumer's assessment of an information source's value may be dependent

on the information that is already stored in internal memory. If one possesses a certain piece of information, one would be unlikely to place a high value on an information source that would duplicate that information.

In addition, consumers may have needs for very different types of information (due to differences in experience or in decision-making criteria), and some information sources may be perceived as providing some types of information better than others. For example, Beales et al. (1981) suggest that direct inspection may be used primarily to obtain information about the existence of alternatives, product dimensions, and price; disinterested third parties may be used most often to obtain product quality information; and seller-related sources may be used most frequently to obtain existence information regarding available alternatives or product attribute information. Houston (1979) reported for five different durables that: (a) durability and dealer reputation were the first and second most important product attributes and that other people were the most important information sources for these attributes and (b) price, style, and extra features were rated the third, fourth, and fifth most important attributes, respectively, and that dealer visits were the most highly rated information source for these attributes.

Given that some information sources have reputations for providing certain types of information and given that consumers will have needs for different types of information

due to individual differences, consumers are expected to place different values on different information sources when purchasing an identical product.

Hypothesis Number Two: Information sources that are perceived as being the most useful will be accessed first during the prepurchase external search for durable goods.

Theoretical and Empirical Support for

Hypothesis Number Three

Since commercial or seller-provided information sources are so prevalent and pervasive in our society, it is reasonable to conjecture that they will be used more frequently than other types of information sources during prepurchase search. LeGrand and Udell (1964) found that the most frequently used information source, excluding store visits, was newspaper advertising. In addition, it has been suggested that this type of information is least costly to acquire in terms of effort (Beales et al., 1981). Contrary to this, Katona and Mueller (1955) found that the friends and relatives information source was the most frequently used, with store visits being the second most used information source. However, since marketer-dominated information comes in a variety of forms and given the ready availability and low acquisition cost of seller-provided information, the following hypothesis will be tendered.

Hypothesis Number Three: Seller-provided information sources will be used in proportions greater than they are found in the shopping environment during prepurchase search

for durable goods. That is, they will be used in proportions greater than they occur in the information environment.

Theoretical and Empirical Support for

Hypothesis Number Four

Will the use of particular information sources discriminate between consumers who conduct very extensive searches and consumers who conduct very limited searches? One might reason that the shortest possible search would involve a store visit which results in a purchase. However, it is not reasonable to assume that the store visit information source would discriminate between consumers because almost all consumers will visit a store during prepurchase external search. Given: (a) the profile of the "information sensitive consumer" developed by Thorelli and Engledow (1980), (b) the "constructive shopper" type who was information sensitive and who read Consumer Reports (Furse, Punj & Stewart, 1982), (c) research reported by Lehner (1984) that 87% of affluent car shoppers consulted Consumer Reports, and (d) the notion that the disinterested third party is the most costly information source (Beales et al., 1981), one might reasonably expect that more extensive external searches could be distinguished from limited external searches by the presence of a neutral source, such as Consumer Reports, in the search sequence. Based on this information, the next hypothesis will be presented.

Hypothesis Number Four: The presence of a neutral source in a consumer's search sequence will be associated with a longer, more extensive external search.

Summary of Research Questions and Hypotheses

Research Question 1: Will consumers exhibit a small number (fewer than ten) of distinctly different sequential patterns of information source usage (external search) prior to purchase decision making for a durable good?

Research Question 1a: Given the use of an information source in the prepurchase external search sequence, will other sources possess varying probabilities of occurring next in the sequence?

Research Question 1b: Is the use of different sequential patterns of external search for a durable good related to one or more demographic, socioeconomic, and/or psychological variable(s) in the expected direction (as summarized in Figure 7)?

Hypothesis Number One: Information from information sources that are perceived as being the least costly in terms of effort will be acquired first during the consumer's external search.

Hypothesis Number Two: Information sources that are perceived as being the most useful will be accessed first during the prepurchase external search for a durable good.

Hypothesis Number Three: Seller-provided information sources will be the most frequently used type of information

source during the prepurchase external search for a durable good.

Hypothesis Number Four: The presence of a neutral source in a consumer's search sequence will be associated with a longer, more extensive external search.

CHAPTER IV

RESEARCH DESIGN AND METHODOLOGY

In the quest to understand the consumer's external search process, it is desirable to utilize a research methodology that will most reliably and validly measure the prepurchase information-seeking process. At one extreme the researcher could track actual external information seeking. At the other extreme, the researcher could ask the consumer to recall a prior external search for information.

Methodological Alternatives

While research involving the measurement of actual external search would be high in external validity, it would be very difficult, time-consuming, and expensive to collect data in this way. Locating those consumers who are planning to buy a particular durable good during the course of a study is difficult since only a fraction of all consumers buy a specific durable good in any year (Tigert & Má, 1983). In addition, it would be nearly impossible to locate these consumers at the point when their external searches begin. Furthermore, some consumers may spend weeks, months, or even years in external information seeking, and this could cause research expenses to be prohibitive.

On the other hand, "post-purchase verbal reports from consumers about their prepurchase information search activities" are subject to many problems (Brucks, 1984). Jacoby et al. (1977) describe information processing as being dynamic in nature, and they criticize cross-sectional

studies that use post-purchase, static approaches. They cite the need for a process methodology, one that will capture the richness of a dynamic process. Post-purchase self-reports also have the disadvantages of: (a) relying on the subject's memory to reconstruct a previously conducted external search and (b) relying on the subject to relate what was actually done during the prepurchase search process. The desire to appear logical or rational often biases consumers' reports of their actual behavior. However, this type of ex post facto research is inexpensive when compared with actual field tests and controlled laboratory studies.

Interactive Data Collection Versus Information Display Boards

The information display board methodology and the interactive data collection methodology are both process methodologies for tracking consumers' information-seeking processes. The information display board appears to be simpler to construct, but it has numerous limitations in relation to the interactive data collection technique.

First, the information display board is in two-dimensional matrix form. Brands and attributes constitute the two dimensions. The information display board does not include a source-of-information dimension, therefore, the researcher is not able to determine which information sources are utilized to gather information. Hoyer and Jacoby (1983) suggest that researchers use a three-

dimensional matrix, which includes types of sources as well as types of information, so that the information acquisition process will be measured more completely and accurately.

The information display board is also criticized for being "overwhelming in content" in that hundreds of pieces of information are placed on an information display board, which is sitting directly in front of the subject throughout the entire exercise (Rosen & Olshavsky, 1983, p. 82). The information display board is awkward, cumbersome and obtrusive (Horton, 1983). On the other hand, Capon and Burke (1980) suggested that information display boards impose an ideal information environment on the subject, thereby reducing the external validity of studies using this approach. Heeler et al. (1980) reported that the position of information on an information display board may bias which information is acquired as well as the sequence of information acquisition.

Given the above disadvantages of the information display board (IDB) methodology, the advantages of the interactive data collection (IDC) methodology will be presented next. While both methodologies are laboratory methodologies, the interactive data collection methodology more closely resembles the consumer's actual decision-making environment and may, therefore, be higher in external validity. The three-dimensional format adds the source dimension, which makes the simulation more realistic. The IDC technique does not force the subject to access

information without consideration of the source of that information. In addition, "the mode of presentation of information encourages a realistic planning process since, as is usually the case in the real world, people do not know what information will be available nor how complete it will be at the beginning of their decision making task" (Brucks, 1984). Instead of presenting all available options at once to the subject, Rosen and Olshavsky (1984) describe the interactive data collection technique as one where the subject first selects an information source and then selects information from that source in a "tree format." This would seem to be more like the true consumer marketplace environment.

Hoyer and Jacoby (1983) state the following advantages of the interactive data collection approach:

- (1) information can be presented to subjects more quickly and efficiently (with little effort);
- (2) the visual bias inherent in the presentation of a physical matrix is eliminated,
- (3) since no physical matrix is present, there is greater flexibility in constructing information environments, and
- (4) due to the fact that the search process is automatically recorded by the computer, data collection is more efficient and reliable (p. 618).

The use of microcomputers with CRT screens for data collection offers several advantages over mechanical data

collection procedures. Billig (1982) suggested that the functions of cleaning and entering data on computer have been eliminated, that interviewer error in questionnaire skipping patterns can be overcome, that data analysis can be conducted before data collection is completed, that faster project turnarounds can be achieved once the software is developed, and that microcomputers have been so miniaturized that they are easier to transport than an information display board.

The interactive data collection methodology can more realistically portray actual information-seeking behavior since subjects can be charged a time cost, which would vary depending upon the information source utilized (Hoyer & Jacoby, 1983; Brucks, 1984). The IDC technique also corresponds more closely to reality because it offers multiple types of information as well as multiple sources (Rosen & Olshavsky, 1984). For example, personal recommendations can be acquired as well as objective attribute information. In addition, after the subject has been introduced to the computer keyboard/screen there is little interaction between the experimenter and the subject, and therefore there is little chance for interviewer bias.

However, the interactive data collection technology possesses some disadvantages which will be explicated here. First, the researcher must have computers available for conducting a study and, second, the development of the software may be costly in terms of time and money (Rosen &

Olshavsky, 1984). Third, a study utilizing the computer may introduce new problems. Rosen and Olshavsky (1984) discussed some "demand artifacts" of this computer data collection methodology. Any laboratory study places subjects in a "let's pretend" situation. Hopefully, most subjects will react with responses that would genuinely represent real-world behavior.

However, by introducing the computer, some subjects may respond more to the data collection instrument than to the actual laboratory task. For example, subjects who are apprehensive of the computer would probably rush through the task and exhibit an under-utilization of information sources. However, user-friendly software and thorough instructions can do much to alleviate this problem. Subjects who would associate a computer study with game playing or who are intrigued by this novel approach to data collection may gather more information than they would under normal circumstances.

A fourth disadvantage of the interactive data collection technique is that it would be virtually impossible to include in a computer program all information sources that a consumer would be likely to use during prepurchase search. Fifth, information search in the actual marketplace often involves demonstrations, trials, seeing and touching. Laboratory studies may not be able to provide these types of stimuli to subjects, but Brucks (1984) has suggested that random access video disks may serve to bring

the laboratory closer to reality. This may be an important improvement since it has been found that consumers may respond differently to verbal product descriptions than to the actual products (Smead, Wilcox, & Wilkes, 1981).

A sixth disadvantage of the computer interactive technology, the inclusion of a time-cost factor, has previously been cited as an advantage. Brucks (1984) states that people perceive the value of information sources differently, but that they will probably be charged the same time cost. In addition, "waiting in front of a blank terminal screen may be much more or much less aggravating than spending time shopping in the real world" (Brucks, 1984, p. 88).

One study investigated sixty subjects' responses to the interactive data collection procedure (Rosen & Olshavsky, 1984). The researchers found that only about 23% of the subjects felt they acquired information as they normally would; forty percent thought they acquired more information because it was easy to access; five percent acquired more information because they were intrigued with the computer methodology; eighteen percent felt they had acquired less information than they normally would due to apprehension of computers, time delays, etc.; and 21% felt they acquired information differently than normal either because they could not examine the product or because an information source that was normally used was not included in the study. It should be noted that the aforementioned percentages do

not add up to 100% because multiple responses were given by some respondents.

Summary of Rationale for Choosing The Interactive Data Collection Methodology. To summarize this section, a laboratory study appears to be superior to actual tracking of consumer search processes for durable goods because the laboratory enables the researcher to study this type of consumer behavior during a shorter period of time, under controlled circumstances, and utilizing a larger number of subjects than might be found conducting actual searches. The laboratory is better suited to the utilization of a process methodology. Ex post facto studies rely on the subject's memory and willingness to recreate a process. Finally, the interactive data collection methodology appears to allow the researcher to more fully measure the search process in a manner that is higher in external validity than the information display board. Based on this information, the research was conducted in a laboratory setting using an interactive data collection methodology.

The Procedure and Tasks

The interactive data collection took place in a micro-computer laboratory located at Plattsburgh State University College. A large number of microcomputers were available and, therefore, several subjects could perform the computer task simultaneously. The researcher did, however, help each subject to get situated at, and oriented to, the computer at the beginning of the task. The researcher was also

available throughout the task when individual subjects had questions.

The interactive data collection procedure took anywhere from one-half hour to two hours to complete. On the average, subjects required forty-five minutes to complete the procedure. The computer questionnaire and simulation were designed to be extremely user friendly; most responses required the subject to press only one key. It was designed to move quickly from question to question, and it was programmed to not accept responses that were not listed as responses on the computer screen.

The color television was chosen to be the product in this study about which subjects would acquire prepurchase information and make a purchase decision. It was chosen because it is a major household durable, it is owned by most households, and the majority of consumers will probably be involved in a television purchase at some point in their lifetime. Hence, this type of purchase would be relevant to most adult consumers. A major risk involved in a color television purchase is performance risk, and Olshavsky and Granbois (1979) suggested that consumers will be more likely to engage in prepurchase choice processes when this type of motivation is dominant. Therefore, this product should provide ample opportunity for investigating prepurchase search.

Computer Task: Pre-simulation Questionnaire

The computer procedure was divided into three sections. The first section could be labelled the pre-simulation questionnaire. It introduced the subject to the study and asked questions to measure the subject's prior purchasing experience, knowledge, confidence, involvement, and perception of risk with respect to the color television product category. In addition, attitudes toward information sources, attitudes about the diversity of stores and brands, and attitudes toward shopping were measured.

Computer Task: Purchase Simulation

The second section of the computer procedure involved a decision-making task. The subject was asked, "You have decided to buy a 13-inch color television. How would you go about it?" This task was menu-driven in that the subject was shown a list of eight information sources along with the time cost (amount of waiting) for each source. (The eight information sources available to the subjects were: magazine advertising, Yellow Pages, newspaper advertising, personal visits to retail stores, Consumer Reports magazine, a phone call to retail stores, catalogs, and a knowledgeable friend or relative.) After choosing one of the eight sources, the subject may have subsequently been faced with further choices regarding the type of information desired from a particular source. Each time the subject indicated that s/he had acquired enough information from a source, s/he was given the opportunity to make the decision to end

the information search and to make a purchase decision (to buy or not to buy).

Leigh (1983) suggested that studies about consumer information seeking should incorporate some improvements. First, he suggests that studies regarding source usage should be decision specific so that researchers can learn why information sources are consulted. Second, Leigh states that information seeking does not always lead to a decision to buy, and that information seekers who decide NOT to buy should also be included in information search studies. The procedure described herein incorporates both of these suggestions.

The eight information sources used in this study were chosen because they appeared repeatedly in the information seeking studies that were cited earlier. However, two other information sources were deliberately excluded from this study--radio and television advertising. Unlike the print media where the consumer must decide to do something (i.e., read the advertisement), television and radio advertising seem to be more likely to confront the consumer, thereby falling into the categories of "interrupts" or "low involvement learning" (Bettman, 1979). The consumer is not actively searching for information acquired from these media, but is usually more attentive to the messages carried by these media when conducting a prepurchase search (Beales et al., 1981). Since the consumer cannot completely control information acquisition from the broadcast advertising media

in terms of when information will be acquired, and since the consumer does not usually plan to seek out TV and radio advertising during prepurchase external search, these media were not included as information source alternatives.

Each information source had to be assigned a time cost. Duncan and Olshavsky (1982) reported on two different studies that resulted in the assignment of weights to information sources based on amount of effort required to gather and comprehend information from each source. One study showed that Consumer Reports and similar guides required the most effort, followed by dealer visits; consultations with salespeople; consultations with friends, relatives and neighbors; magazine advertisements; newspaper advertisements; and radio and television advertisements (tied for last). The other study found an "other sources" category required the most effort, followed by Consumer Reports and dealer visits (tied); consultations with salespeople; consultations with friends, relatives, and neighbors; and magazine, television, and newspaper advertising tied for last.

Since the information sources to be used in the present study are not entirely the same sources as were used in the previously cited studies, an expert panel of thirteen marketing and consumer economics professors was surveyed to ascertain a measure of effort required to gather and comprehend information from each source. This expert panel regarded personal visits to stores as requiring the most

effort, followed by Consumer Reports magazine; store catalogs; telephone calls to stores; magazine advertising; Yellow Pages; newspaper advertising; and consulting a knowledgeable friend or relative.

While the graphics capability of microcomputers has improved tremendously over the last few years, microcomputer graphics are still very primitive and very difficult to program. Since advertising relies on layout, pictures, color, and special typefaces for results, and since it is not realistic to assume that subjects would make a decision to buy a color television on the basis of a written description, it was decided to provide subjects with some pictorial information in folders. Thus, to overcome the limited graphics capability of microcomputers, subjects were able to view actual advertisements, catalog pages, and Consumer Reports evaluations as well as photographs of each color television model.

However, subjects were still not able to use the very important, but subjective, criterion of picture quality to evaluate the alternatives. Instead, they may have been forced to use less important criteria, such as price or cabinetry, to make their decisions. This would appear to detract from the study's external validity.

Computer Task: Post-simulation Questionnaire

The third section of the computer procedure could be labelled a post-simulation questionnaire. Measures to determine attitudes regarding: the usefulness of different

information sources, the importance of saving money, and the importance of brand and store reputation in the purchase decision were included. Also included in the third section were questions to detect store and brand loyalty and numerous classification questions. Finally, a group of questions was included to ascertain whether subjects felt that the computer interactive technology realistically measured their information seeking processes.

Validation of the Measure

In an attempt to investigate the validity of the information display board methodology, Heeler et al. (1980, p. 38) made the following statement: "Since there is no direct way of determining actual information acquisition in real-world decisions, agreement between alternative indirect ways is a valuable check on measures." The same concept can be applied to an investigation of the validity of the interactive data collection procedure. Therefore, it was determined that a second data collection methodology be utilized in order to determine if there is convergent validity.

The second method of data collection involved individual personal interviews with recent purchasers of color televisions. These purchasers were asked to recall and recreate their prepurchase information-seeking processes. They were advised to mention all information sources they used and were instructed to recreate the search in the proper sequence.

This type of ex post facto research may result in poor measures of search behavior since it relies on the purchasers' memories. The search measures reported by the purchasers may be inaccurate or incomplete due to memory loss, or embellished to make the purchaser's decision process appear more rational or thorough. In addition, the personal interview is very likely to introduce the problem of interviewer-interviewee interaction bias.

However, this group of recent purchasers was also asked to perform the computer interactive data collection procedure as a further validation check. Not only can two different groups of people using two different data collection methodologies be compared, but the same group of people using two different data collection methodologies can also be compared. If the different methodologies produce results that are similar, then we can be more certain that we are measuring what we intended to measure.

The population from which subjects were taken for these personal interviews included all those residents of the Plattsburgh area who were eighteen or older, heads of households, and who had purchased a color television within the past six months. The type of sample used for this segment of the study was a nonprobability, convenience sample. Each retail store that was included in the study was contacted and was requested to refer from three to five color television purchasers to the researcher for interviewing. Hence, it was a convenience sample since

store employees selected color television purchasers who were conveniently available. On the other hand, it was somewhat like quota sampling in that each store was given a "quota" of purchasers to supply to the researcher. These "quotas" contribute to greater representativeness of the sample since the stores in the study are representative of the different types of stores that sell color televisions.

The number of people who were referred to the researcher by retail stores as recent purchasers was twenty-five. The initial contact with potential subjects was made by a retail salesperson in the store. The purchaser was given a business card of the researcher and was requested to contact the researcher in order to communicate his/her willingness to participate in the study and to set up an appointment for an interview. The purchasers were informed that they would be given a fifteen dollar incentive for their participation in the study.

Since the recent purchaser group was to participate in two different data collection procedures, it was important to separate the two measures by a reasonable time interval so that one measure would not bias the other measure. Members of this sample were asked to participate in the personal interview first. All interviews were conducted by the author of this research to ensure consistency. The researcher then made an appointment with the subject at a later date to conduct the interactive data collection procedure. The interactive data collection procedure was

always conducted last so that the stimuli in the computer program would not have a chance to bias the personal interview. The subjects in this sample were not compensated until they completed both parts of the study.

Finally, the computer interactive data collection procedure was pre-tested using twenty subjects (10% of the planned sample) in order to determine if there were any major problems in the computer program and with the questionnaire design. This step was important since the actual research was going to be expensive in terms of computer time and subject compensation. The pre-test uncovered some problems that were unique to computer questionnaires as well as problems with the comprehension of questions and their directions. As a result of the pre-test, the computer program was improved and the questionnaire was modified.

Sampling Design

The implementation of this study required the use of two different samples of subjects. The responses from the larger sample were used to form the basis of most of this study's findings. The responses from the smaller sample were used to aid in the validation of the research methodology. Below is presented a discussion of the sampling methodology utilized, followed by descriptive statistics of the samples.

The larger sample chosen for this study (hereafter referred to as the Primary Sample) was selected from a

population that included all residents of the Plattsburgh, New York area who also met the requirements of being at least eighteen years old and holding head-of-household status. Although durable goods purchase decision making often involves multiple information seekers and joint decision making, the purchase of a television has been found to be somewhat more autonomic than purchases of other durables (Bonfield, 1978). Because the television purchase is one that involves more autonomy, it seems reasonable to allow each subject to proceed through the purchase simulation alone. If the purchase simulation had been for something, such as a family vacation, that traditionally has more input from more than one person, then the methodology proposed here would be inappropriate.

Although exploratory studies do not require the researcher to go to the lengths of obtaining a probability sample, a probability sampling technique was used in this research. Random sampling was utilized so that greater confidence could be held in the representative nature of the sample. A representative sample is important because a typology of search sequences may result from this research, and this could not be achieved without a representative sample.

A simple random sample of six hundred people was drawn from the Plattsburgh City Directory, which was used as the sampling frame for this study. This directory is prepared and published independently of other directories, such as

the telephone directory. Its major advantage over the telephone directory as a sampling frame is that it includes people with unlisted phone numbers as well as people without telephone service.

A relatively large sample size was desired due to the large number of possible information search sequences that could have resulted as well as the large number of variables that were used in the study. The people chosen to be in the Primary Sample were first contacted by letter. The letter invited them to participate in the study and provided them with a medium for communicating their willingness to participate. The letters were all mailed in late December of 1984 and in early January of 1985.

This study made substantial demands on its subjects. First, the subjects had to transport themselves to the state university in order to participate. Second, the actual interactive computer task required an average of forty-five minutes to perform. Third, the task was one that required a good deal of mental effort, something that some people would prefer to avoid during their leisure hours. Due to these demands on the subjects, each person was offered an incentive to participate in his/her initial contact letter. They were given the choice between receiving a ten dollar payment or having a ten dollar payment donated to a local charity in their name.

Out of the six hundred names selected randomly, a final total of two hundred one people responded and were included

in the Primary Sample. This is a 33.5% response rate. These subjects made appointments, and the majority of them participated in the study during the month of January of 1985. Out of the two hundred one respondents, sixty-four chose to donate their participation incentive to a local charity or a nonprofit organization. This amounts to 31.8% of the sample donating their incentive money to a charitable cause. It appears that providing potential subjects with a choice of incentive may motivate more people to respond since different incentives appeal to different motives and needs. Whereas two-thirds of the respondents preferred to be paid the ten dollar incentive directly, the other one-third may have been influenced to participate because they could have their tax-deductible donation sent directly to the charity of their choice and they were also helping someone to conduct a worthwhile research project.

Profiles of the Samples and Comparison to Census Data

After all the data had been collected from the Primary Sample, it was stored on fifteen different floppy computer disks. The data was subsequently merged onto one microcomputer floppy disk and then transferred into the memory of a minicomputer for data analysis. The same procedure was followed for the Validation Sample data. Utilizing the SPSSx software package, frequency distributions and relative percentages for various demographic characteristics were calculated. In an effort to determine if the sample profiles matched the profile of

the population from which they were taken, statistics for characteristics that were available for the City of Plattsburgh population from the 1980 U.S. Census are compared in Table 1.

In looking at the comparison between the sample profiles and the Census data, it appears that some variable categories are under-represented and others are over-represented. However, in view of the fact that the city from which the sample was taken is a "college town," the composition of the sample is not surprising. Included in the Census figures are college students, many of whom live in dormitories and many who are not married. The large proportion of single persons reported in the census data may also be due to the large U.S. Air Force and prison populations. The college students, for the most part, are not considered to be heads of households and most are not listed in the Directory, which was used as the sampling frame. In addition, the large number of college students probably accounts for the large number of people in the 18-24 age category as well as the large number of households with low incomes.

The large number of people who possess less than a high school diploma was surprising. Since this is a potentially embarrassing question, some respondents may have inflated their educational level a bit. On the other hand, it is possible that people with lower than average levels of education do not respond to surveys in as great proportions

Table 1

Comparison of Sample and Census Demographic Profiles

Characteristic	Primary Sample	Validation Sample ²	Census Data
Sex: Female	51.2%	64.0%	55.1%
Male	48.8%	36.0%	44.9%
Marital Status:			
Married	70.6%	88.0%	38.9%
Single	13.9%	12.0%	45.7%
Other	15.4%	0.0%	15.4%
Age:			
18 - 24	9.0%	16.0%	39.1%
25 - 29	10.9%	4.0%	9.7%
30 - 34	14.4%	12.0%	8.2%
35 - 39	18.4%	16.0%	
40 - 44	11.4%	24.0%	9.9% ³
45 - 49	10.0%	8.0%	
50 - 54	9.5%	8.0%	9.5% ⁴
55 - 59	5.0%	8.0%	4.8%
60 - 64	5.0%	4.0%	4.2%
65+	6.5%	0.0%	14.7%
Education Level Achieved:			
Less than High School	3.5%	4.0%	29.4%
High School Diploma	17.9%	32.0%	28.7%
Some College, No Degree	31.8%	40.0%	
Associates Degree	9.5%	0.0%	19.5% ⁵
Bachelors Degree	21.9%	4.0%	
Masters Degree	13.4%	8.0%	
Professional/Doctors Degree	2.0%	12.0%	22.4% ⁶
Household Income: (annual)			
Under \$10,000	12.1%	8.0%	40.6%
\$10,000-19,999	20.1%	16.0%	29.6%
\$20,000-29,999	22.1%	24.0%	
\$30,000-39,999	20.6%	32.0%	21.8% ⁷
\$40,000-49,999	13.6%	4.0%	5.5% ⁸
\$50,000 & over	11.6%	16.0%	2.5%
Missing answers	1.0%	0.0%	---

- 1 For Primary Sample, n=201
2 For Validation Sample, n=25
3 equals combined 35-39 and 40-44 age groups
4 equals combined 45-49 and 50-54 age groups
5 equals combined some college and associates degree

- 6 equals bachelors degree and above
7 represents \$20,000-34,999
8 represents \$35,000-49,999

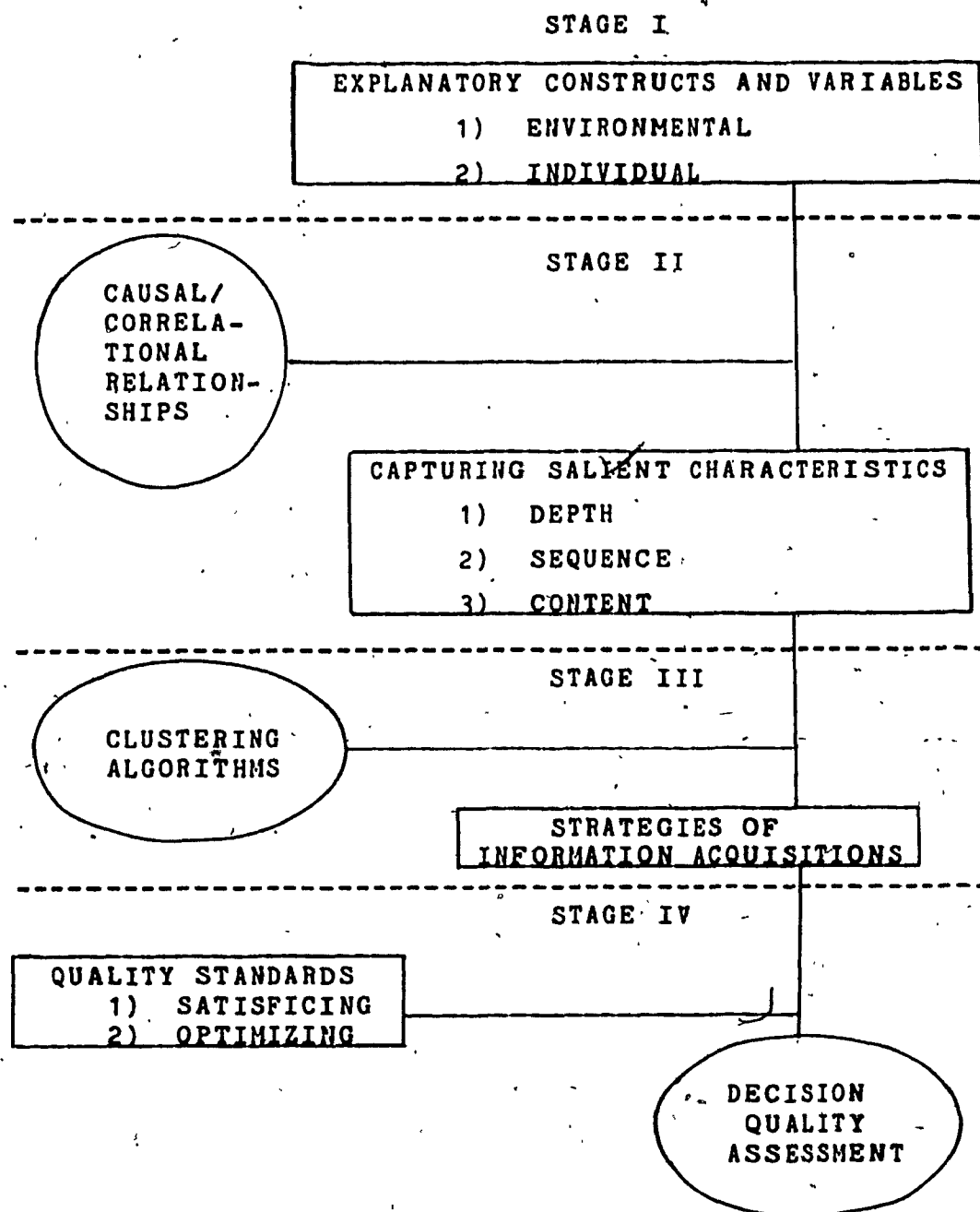
as people with more education. If it were possible to eliminate the college student population from the Census data, it is quite possible that the sample profiles would better match the Census data.

Research Paradigm Adopted

The research methodology described herein is somewhat new and quite different from most marketing research in that it is a process methodology designed to capture consumers' decision making processes while they are occurring rather than retrospectively. However, the use of a process methodology, involving the computer as an interactive data gathering device, requires that appropriate techniques for analyzing process data be utilized. Jacoby et al. (1977) developed an approach to analyze process data obtained from two-dimensional information display boards, and this approach will be described here as it relates to the three-dimensional computer interactive data collection methodology.

The research paradigm developed by Jacoby et al. (1977, p.308) for the analysis and interpretation of process data is a four-stage procedure. The paradigm is shown in Figure 8. Stage I of the model involves the determination of constructs and variables that would aid in the explanation of differences in external search behavior. These may include environmental and/or individual variables. Jacoby et al. (1977) suggest that individual difference variables have not been studied extensively in this regard, and they

Figure 8. The Jacoby et al. four-stage research paradigm.



Note. From "Prepurchase Information Acquisition: Description of a Process Methodology, Research Paradigm and Pilot Investigation" by J. Jacoby et al., 1977, Advances in Consumer Research, 3, p. 308. Copyright 1977 by the Association for Consumer Research.

may have an effect on search behavior. This research includes predominantly individual variables, which are operationalized in Appendix A-1.

Stage II variables are those variables that are descriptive of search behavior. These search behavior characteristics may describe the consumer's search with respect to the depth, content, and sequence of search. For example, a depth-of-search variable might be one that measures the number of different information sources utilized. A content-of-search variable may be one that measures whether a source provides information regarding store or brand or both. A sequence-of-search variable may be one that measures the order in which information sources are accessed. The variables that describe search behavior are operationalized in Appendix A-2.

Stage I and II variables may be analyzed together to determine if there exist any causal or correlational relationships between the two types of variables. The purpose of this step is to try to "isolate the determinants of selective exposure" to information (Jacoby et al., 1976, p. 5).

The Stage III variables are the various information acquisition strategies that are utilized by consumers. These strategies are determined by the presence of different configurations of consumers' depth, content, and sequence of searches. A clustering algorithm, which would aid in "reducing the multivariate 'process' data-base to some

limited number of coherent search strategies," is an appropriate analytical technique (Jacoby et al., 1976, p. 7).

Hambrick (1984) discussed the usefulness of cluster analytic techniques in the development of management strategy taxonomies. According to Hambrick, the hierarchical type of cluster analysis is the dominant technique used in taxonomy construction. However, some consumers may be similar to poorly-run businesses in that they may not have a cohesive problem-solving strategy. If this is the case, then cluster analysis may not result in interpretable clusters due to the noise introduced by the random, incohesive external search of some consumers. Regarding this, Hambrick (1984, p.39) stated that "hodgepodge clusters derived from . . . some comprehensible and some incomprehensible strategies that are so interspersed in an n-dimensional space" may be the result.

The final stage of this research paradigm, Stage IV, involves an assessment of the quality of information search via an assessment of the accuracy of the purchase decision. One must have satisficing and/or optimizing standards for use as variables to assess decision quality. Since a major purpose of this research is to develop a taxonomy of external search strategies, this research will follow the proposed research paradigm from Stage I through Stage III and will not attempt to evaluate the quality of decisions resulting from the information acquisition strategies.

Overview of Data Analysis

Since the primary objective of this dissertation is to determine if there are common patterns of information search sequences, the most appropriate statistical approach would involve a cluster analytic methodology. In order to test the reliability and validity of the resulting clusters, a split-half analysis using discriminant analysis was used. Furthermore, more than one cluster analysis algorithm was used in order to determine if the clusters were reliable.

Resulting cluster memberships were cross-tabulated with numerous other variables that were not used in the clustering process so that a richer profile could be obtained for the different clusters. Tests of some of the research questions required simple counting and chi-square tests of significance. This overview of the data analysis strategy is presented in Figure 9.

Summary

The rationale for the research design used in this study was presented in this chapter. The computer interactive data collection methodology was chosen for use over the information display board laboratory technique because it appears to be more realistic, more accurate, and less cumbersome.

The procedure used for conducting the research and the three-part task required of the sample subjects were explained. Each subject performed in a simulated purchasing

Figure 9. Flow-Chart of Data Analysis.

Major Research Questions 1, 1a, 1b

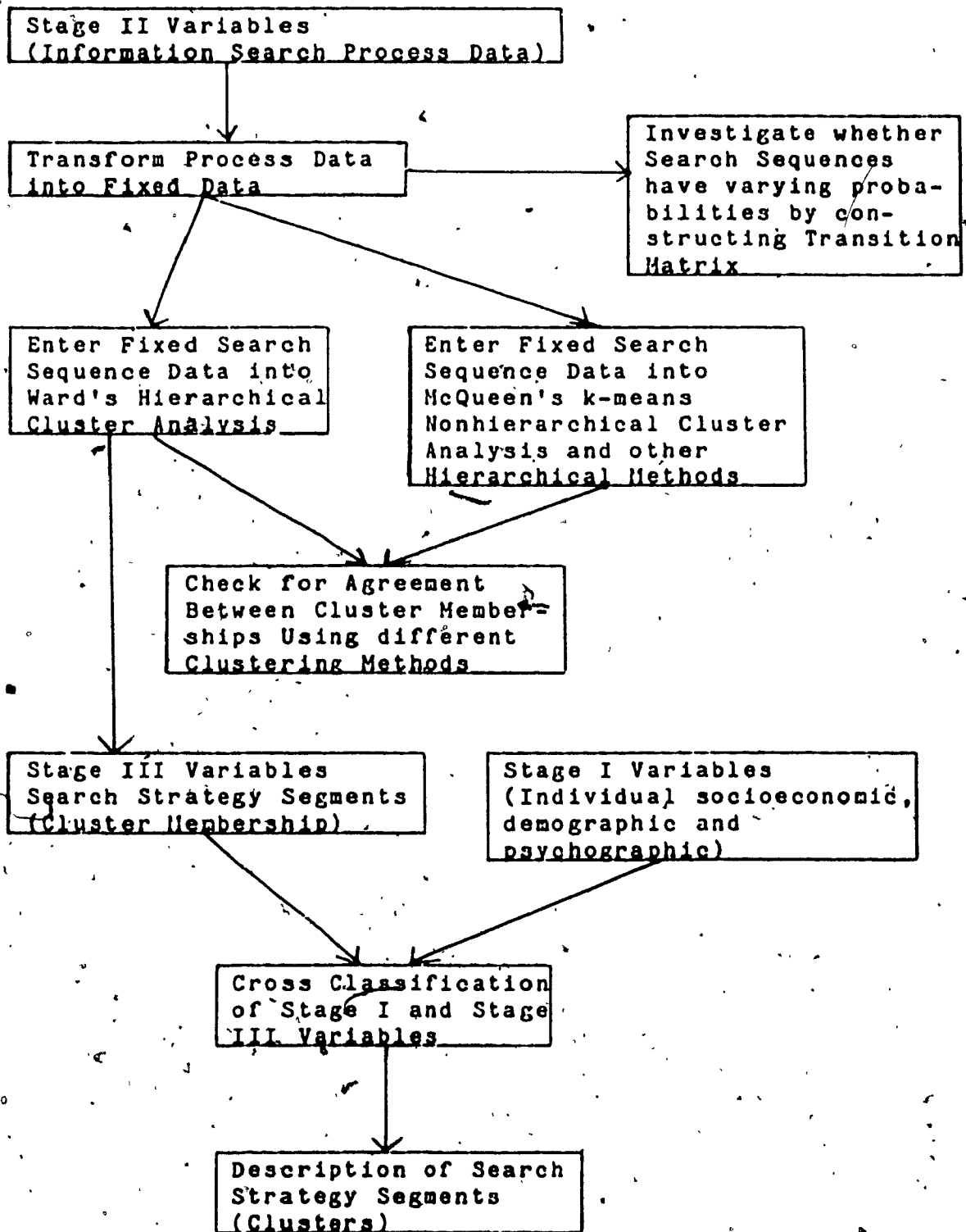
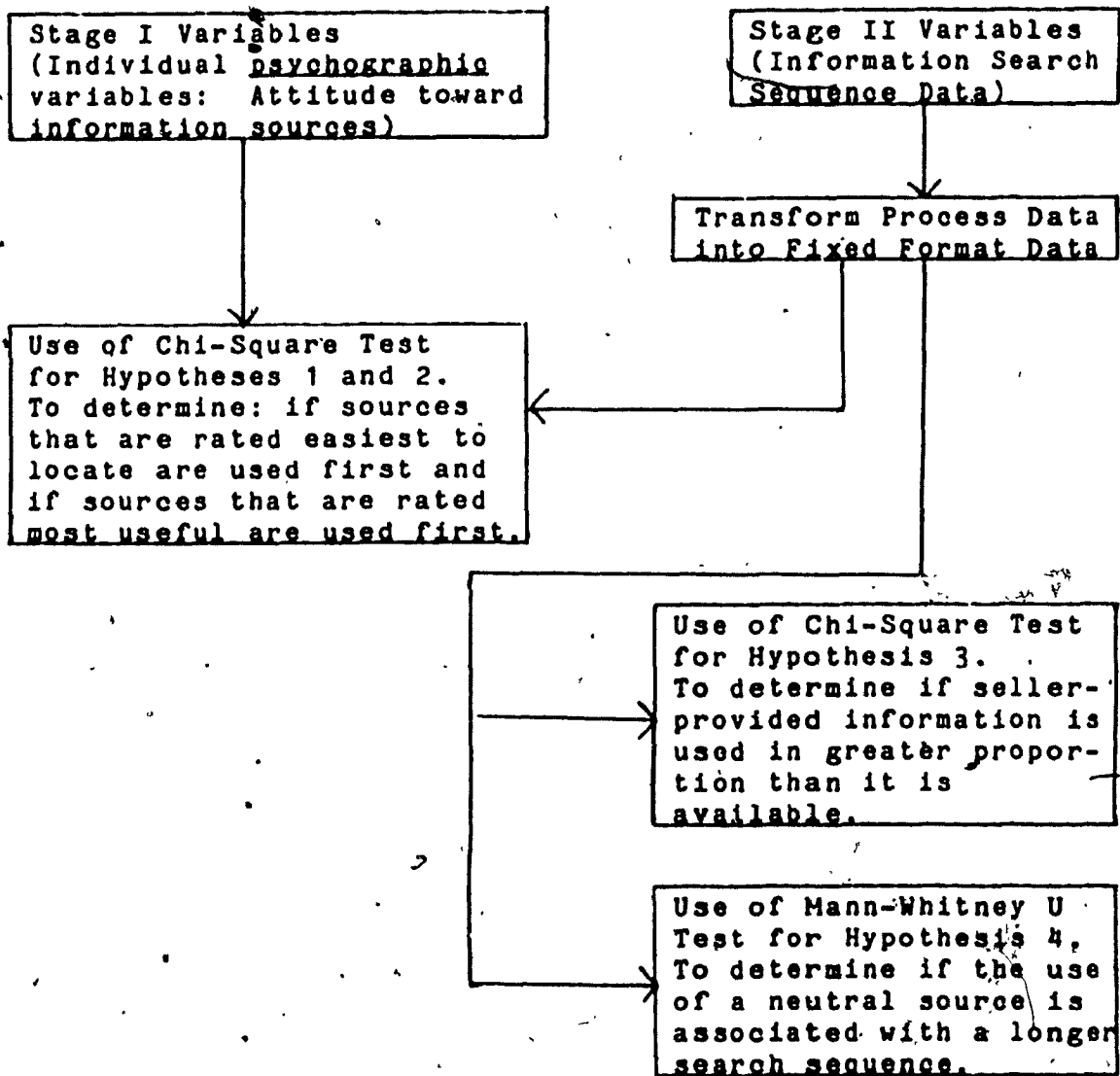


Figure 9 continued

Related Questions/Hypotheses 1 through 4



situation and answered questions on the computer before and after the purchase simulation.

The sampling plans for the primary sample of subjects (probability) and the secondary sample (non-probability) were presented. The purpose of the secondary sample was the validation of the computer interactive data collection methodology. The major descriptive statistics of the primary and secondary samples were compared with 1980 census data to determine whether the samples were representative of the local population.

Finally, the Jacoby et al. (1977) research paradigm, which was developed to help researchers analyze process data, was presented. An overview of the plan to analyze data collected in this study was provided.

CHAPTER V

RESEARCH RESULTS

I Introduction

The research carried out for this study produced a large amount of data. The results of the research, including a discussion of the research questions and hypotheses, are reported here. An analysis of the validity of the research methodology is also presented. This chapter will begin with some interesting general findings.

General Research Results Concerning

Information Search

Before investigating the research questions and hypotheses, some general research results will be presented to provide the reader with preliminary information about the prepurchase information search process for a durable good.

Frequencies of First and Last Sources Used

The first source that is most likely to be used by consumers in their search for a durable good is a personal visit to a retail store. Approximately forty percent of the subjects in this study used the store visit as their first source in their searches. Below is a list in descending order of the percentage of people using each source as their first source:

- 1) Personal Visit to Retail Store -----40.3%
- 2) Consumer Reports magazine -----22.9%
- 3) Newspaper Advertising -----14.9%
- 4) Catalogs -----10.0%

- 5) Knowledgeable Friend or Relative ----- 7.0%
- 6) Yellow Pages ----- 2.0%
- 7) Magazine Advertising ----- 1.5%
- 8) Telephone Call to Retail Store ----- 1.5%

The Personal Visit to Retail Store source was also found to be the most frequently used last information source by an even larger proportion of consumers, as would be expected. Below is a list in descending order of the percentage of subjects who utilized each information source as their last information source:

- 1) Personal Visit to Retail Store -----63.0%
- 2) Knowledgeable Friend or Relative -----10.0%
- 3) Catalogs ----- 7.5%
- 4) Consumer Reports magazine ----- 7.0%
- 5) Newspaper Advertising ----- 5.0%
- 6) Telephone Call to Retail Store ----- 4.0%
- 7) Magazine Advertising ----- 2.0%
- 8) Yellow Pages----- 1.5%

As one can see, the Personal Visit to Store source dominates as the major source of information for this particular durable goods purchase. The two lists presented above also point out the importance of certain sources early in the information search process and of other sources later in the information search process. The Consumer Reports magazine seemed to be very important at the start of many information searches, but became less important as a last source. Using the Knowledgeable Friend or Relative source,

became somewhat more important at the end of the search process than at the beginning of the search.

Newspaper Advertising seems to be more predominant as a first source than as a last source. It probably is used as a preliminary source to determine where to go for further information (such as retail stores, catalogs, or Consumer Reports). The use of Catalogs as an information source became somewhat less important when comparing its use as a first source and last source. Finally, the Telephone Call to Retail Store was slightly more important as a last source than as a first source, perhaps because some purchase decisions can be made over the telephone and an order can be subsequently placed.

Number of Sources Used Before Purchase Decision

Another way to look at the search patterns of the subjects in this study is to determine what proportion made their purchase decisions after using the first source, second source, third source, etc. Table 2 depicts how many subjects exited from their prepurchase searches and made a purchase decision at each step.

Table 2 clearly shows that almost 47% of the subjects in this study were ready to make a purchase decision after using only one information source. Two-thirds of the sample made a purchase decision after utilizing two information sources, 83% decided after three information sources, 91% made a purchase decision after four information sources, and 97% decided after accessing five information sources. The

Table 2

Proportion of Subjects Who Made a Purchase Decision at Each Step

Purchased After Using:	Number	Percentage	Cumulative Percentage
First Source	94	46.8%	46.8%
Second Source	40	19.9%	66.7%
Third Source	32	15.9%	82.6%
Fourth Source	17	8.5%	91.0%
Fifth Source	12	6.0%	97.0%
Sixth Source	4	2.0%	99.0%
Seventh Source ^a	2	1.0%	100.0%

^aThis does not necessarily mean that seven different sources were used. Subjects were able to go back and use a source a second time.

mean number of information sources used by the members of this sample was 2.17. Subjects using six or seven information sources are certainly a very small minority of the sample. These results appear to be consistent with numerous studies' results with regard to the large proportion of people who conduct very short searches before making purchase decisions.

Sufficiency of Each Source as Sole Information Source

It would also be informative to analyze what proportion of people using each of the eight information sources as their first source made a purchase decision after the first source. Table 3 presents the data regarding how many people used each source as their first source and shows the percentage of them who made a purchase decision after using only the one source.

It is clear from Table 3 that when one uses the personal visit to a retail store to obtain information first, that in eighty percent of the cases no other information source will be used. Although the numbers are too small to be conclusive, two out of three users of the telephone-call-to-the-retail-store information source concluded their searches after using that source. It appears that the retail store, whether visited in person or by phone, provides valuable information to many consumers so that they no longer feel the need to obtain additional information from other sources.

Table 3

Proportion of Subjects Exiting the Purchase Simulation After
Using Only One Source

Source Used First	Number Who Used Source First	Number (and Percentage) Who Made Purchase Decision After Using First Source
Magazine Advertising	3	1 (33%)
Catalogs	20	7 (35%)
Yellow Pages	4	1 (25%)
Personal Visit to Retail Store	81	65 (80%)
Newspaper Advertising	30	6 (20%)
Friend or Relative	14	6 (43%)
<u>Consumer Reports</u>	46	6 (13%)
Telephone Call To Retail Store	3	2 (67%)

Forty-three percent of the people using the knowledgeable friend or relative source as their first source made a purchase decision based solely on the advice of that source. Hence, information and advice from a trusted friend or relative may be all the information that some consumers want or need in order to make a purchase decision. It seems, then, that a trusted, knowledgeable person is the next best thing to being there!

This general information regarding consumer prepurchase search for durables emphasizes the importance of the personal visit to retail stores. The store visit is often the only information source used prior to purchasing a durable good, and it is also most likely to be used as a first and/or last source in the search sequence.

Research Question One: An Investigation of Prepurchase Search Sequences for a Durable Good

Are distinctly different sequential patterns of information source usage found in consumers' decision making processes for the purchase of a durable? And if so, what are the configurations of the sequential patterns of source usage? These questions are components of the primary research question of this study.

An appropriate technique for analyzing the data gathered in this study and for identifying different search strategies is cluster analysis. Since this is exploratory research and very little is known about the category structure of the problem, Anderberg (1973) suggests that

cluster analysis is more appropriate than other category-sorting statistical techniques (such as discriminant analysis) when "all that is available is a collection of observations whose category memberships are unknown" (p. 2).

Anderberg (1973) also stated:

The operational objective in this case is to discover a category structure which fits the observations. The problem is frequently stated as one of finding the "natural groups." In a more concrete sense, the objective is to sort the observations into groups such that the degree of "natural association" is high among members of the same group and low between members of different groups. (p. 2)

Finally, Anderberg (1973, p.4) posited that "One of its (cluster analysis)'s most useful roles is to generate hypotheses about category structure....Put another way, cluster analysis may be used to reveal structure and relations in the data. It is a tool of discovery." It is for that purpose that cluster analysis was proposed for this study.

Decisions Regarding Cluster Analysis Technique

Cluster analysis requires the researcher to measure elements or objects on variables. The second step requires the researcher to obtain an inter-object similarity or distance measure/matrix. The third step requires the researcher to determine which procedure will be used for forming clusters from the similarity or distance measure.

The clusters can then be cross-classified with the clustering variables as well as with external variables to determine on which traits the clusters differ.

The use of cluster analysis in a study requires the researcher to make several important decisions pertaining to the technique. Below is a list of options that require a choice:

1. hierarchical (agglomerative) versus nonhierarchical (iterative)
 - a. method of cluster linkage
 - b. similarity or distance measure

The objective of this research is to determine if there are groups of people who use similar search sequence strategies. Hierarchical clustering was selected for use in this study because:

- a) it can achieve optimally homogeneous groups (Johnson, 1967);
- b) it does not require any advance specification of the number of clusters or the initial cluster centroids (Punj and Stewart, 1983); and
- c) it is appropriate for building a taxonomy (Hambrick, 1984).

It is essentially a fusion process, which starts with as many clusters as there are elements and continues until all elements have been fused into one cluster.

Ward's minimum variance method, which minimizes the within-cluster variance, was selected for the following reasons:

- a) Ward's technique was found to outperform other clustering methods (i.e., to detect genuine structure) in a variety of marketing applications (Punj and Stewart, 1983);
- b) Ward's technique tends to produce hyperspherical clusters. Studies have shown that methods such as this are space-dilating and result in a recovery of cluster structure that is superior (Aldenderfer and Blashfield, 1984); and
- c) Ward's method is the best method to use when outliers are present, when all cases must be classified into a group, and when clusters are not well separated or when there are "noise points" between cluster boundaries (Aldenderfer and Blashfield, 1984).

When using cluster analysis, the researcher must choose a resemblance coefficient (similarity measure) that is appropriate for the type of data and the type of clustering method. Since the data are primarily binary in nature, it would have been desirable to use some type of qualitative resemblance coefficient, such as the Jaccard similarity measure or the Sokal and Sneath similarity measure. This

type of measure was not used for the following reasons:

- a) all of the clustering variables were not binary variables;
- b) Ward's minimum variance method possesses a "built-in dissimilarity coefficient" (the squared Euclidean distance measure) which is an inalterable part of the method. The researcher loses the option of selecting a resemblance coefficient when using Ward's method; and
- c) it was not available as an option on the Data General version of SPSSx.

When one has a mixture of quantitative and qualitative attributes, one strategy for handling this mixture is to ignore the fact that the variables are mixed and to use a resemblance coefficient suitable for quantitative attributes. Romesburg states that "this simplistic solution /may appear absurd, but in fact it often works . . . The results will not be very sensitive to our having treated qualitative attributes as if they were quantitative attributes" (1984, p. 171). Punj and Stewart (1983, p. 143) state further that "One conclusion in several of the studies is that the choice of similarity/ dissimilarity measure, or distance measure, does not appear to be critical . . . The selection of a similarity measure appears to be less important for determining the outcome of a clustering solution than the selection of a clustering algorithm."

To summarize, the Ward's hierarchical method of cluster analysis using the squared Euclidean distance measure was selected to be the classification methodology for this study. Next we shall look at how the variables that were used in clustering procedure were chosen for inclusion.

Choice of Clustering Variables

Since the research question asks whether there are distinctly different sequential patterns of source usage, it is clear that those variables that represent the consumer's search sequence (Stage II variables characterizing sequence of search) are most appropriate for inclusion into cluster analysis. The search sequence can be characterized by:

1. Which information source was used first?
2. Which information source was used last?
3. What type of transitions the subject exhibited in going from one source to the next?

Each subject's data file contained both the first source used and last source used in easily accessible form. However, the data were transformed so that the information source that was utilized as the first source most frequently was recoded as 1; the source used as the first source with the next highest frequency was recoded as 2; and so on. The same thing was done for the "last source used" variable.

The transitions exhibited by consumers in their information searches were not easily extracted from the computer record generated by the computer simulation. Since the length of each subject's search was dependent upon how

much searching the subject wished to do, each subject produced a computer file of a different length. The computer stored all the sources accessed in the order in which they were accessed by the subject, but the transitions from source to source were not part of the record. In addition, since each subject could access the different information sources in any order, a simple tabulation of how many subjects used each information source could not be done. Instead, even this data had to be transformed from the process data. In all, more than fifty data transformations were made so that the process data generated by the computer simulated purchasing exercise could be analyzed with variables that were in fixed format.

For example, eight fixed fields had to be set up to access any of the eight information sources. When the respondent used a particular information source, it was recorded in the appropriate fixed field for that source along with the sequence of usage (i.e., whether it was the first, second, third, etc. source used). In order to determine the sequence of source usage, each person's sequence had to be constructed from the eight fixed fields. This was made necessary by the fact that respondents could access the information in any order they desired, and they could access as much or as little information as desired. Other data transformations were made to serve a counting function. That is, each subject's data file would show how

many stores, catalogs, friends, etc. were consulted as well as how many questions were asked of particular sources.

The simplest transition is for a sequence of two values, that is, from one source to the next. A transition matrix was developed from all subjects who had sequences of two values in their transformed data files. Those subjects who used only one information source and who, therefore, exhibited no two-source transition were coded differently and were not included in the transition matrix.

The transition matrix is an 8 x 8 matrix, with only 56 out of the 64 cells having an expected frequency. The cells on the diagonal were not expected to have an entry because a transition could not occur if a subject went from one source to the same source. By definition, if a subject used an information source (such as a personal visit to a retail store) and used the same source immediately after (to visit a different retail store), then it is considered as using one source type.

In actuality, only 43 of the 64 cells contained at least a frequency of one. In an effort to enter only the major two-source transitions into the cluster analysis, the focus was placed on the ten cells with the highest frequencies in the transition matrix. These ten cells had frequencies ranging from 9 to 22. The remaining fifty-four cells had frequencies ranging from zero to seven, and a judgment was made that these 2-source transitions did not occur enough to justify their use as clustering variables.

The transition matrix can be found in Table 8. These ten transitions were then added to each subject's file as ten binary variables (0 = transition not present; 1 = transition present).

For many of the subjects in this study, there was not even one transition of two values because the subject used only one source. The proportion of people falling into this category was quite large. Approximately 45% of the primary sample (n = 201) accessed only one information source before making a purchase decision. Therefore, a variable indicating whether only one source was used or not was added to each of the subject's data files. This was a binary variable, with "1" representing the use of only one source.

A frequency distribution in descending order is presented for all two-source, three-source, and four-source search sequences in Appendices B-1, B-2, and B-3, respectively. Only three-source sequences that occurred at least three times in the study were retained. Out of the 132 three-source sequences exhibited by subjects, there were eleven three-source transitions which met the frequency criterion of three. This criterion was necessary to keep the number of variables at a manageable level. The presence or absence of each of the eleven 3-source transition types was included in each subjects' data file as a binary variable. While there were sixty-three four-source sequences in the data set, only two out of the sixty-three had a frequency greater than one. This reveals that while

there is much commonality in shorter search sequences, longer search sequences tend to be unique.

To summarize, the variables that were included as clustering variables were the following Stage II variables, which describe the subject's search sequence in some way:

1. Source used first (Values range from 1 to 8, with 1 representing the most frequently used first source and 8 representing the least frequently used first source).
2. Source used last (Values range from 1 to 8, with 1 representing the most frequently used last source and 8 representing the least frequently used last source).
3. Ten binary variables representing the ten most popular transitions of two sources (Values were 1 for presence of transition type and 0 for absence of transition type).
4. Eleven binary variables representing the eleven most popular transitions of three sources (Values were 1 for presence of transition type and 0 for absence of transition type).
5. Binary variable representing whether the subject used only one source (value = 1) or more than one source (value = 0).

The most significant sequential source usage information is captured in these five categories of variables. The single-source users of information are

captured perfectly by the first, second, and fifth variable categories explained above. This accounts for approximately one-third of the subjects' search sequences. The essence of the other two-thirds of the subjects' search sequences are captured in the ten most popular 2-source transitions as well as in the source-used-first and source-used-last variables. While some of the 2-source transitions are contained in 3-source transitions, the use of the 2-source transitions represents the most parsimonious use of the data.

Choice of Computer Statistical Package

Whereas the decision to use Ward's method of hierarchical cluster analysis had been made previously, it became necessary to locate the appropriate computer software with which to analyze the data. The SPSSx statistical software package for the Data General minicomputer was available to the researcher, and it contained seven hierarchical clustering algorithms, including Ward's method, as well as one nonhierarchical method.

The availability of more than one algorithm was important so that the reliability of clusters could be measured using more than one clustering method. While it would have been desirable to create special proximity measures for the binary variables in the study, this procedure was not available yet on this version of SPSSx.

The Clustering Procedure

Before introducing the variables into the clustering algorithm, the issue of standardizing variables must be addressed. Most of the clustering variables are binary variables, except for the two variables that indicate what source was used first and what source was used last by the subject. The value of these variables ranged from one to eight, and that would mean that they would overpower the binary variables in the clustering procedure. Funkhouser (1983) stated that when different metrics are used, it is important to standardize the variables in order to achieve comparability among different variables.

In order to avoid the problem of noncomparability, it was decided to standardize only the two variables with a range in values from one to eight so that they would approximately equal in weight to the binary variables. Furthermore Romesburg (1984) stated that qualitative attributes with values of only "0" and "1" never need to be standardized. Hence, after standardizing the two ordinal variables, the ordinal variables will have a mean of "0" and a standard deviation of "1" and the binary variables will have values of either "0" or "1."

All of the variables cited above were introduced into cluster analysis using Ward's method. Numerous computer runs were made in an attempt to determine whether fewer variables might cluster the subjects just as efficiently. This was accomplished by examining cluster assignments while

varying the number of clustering variables. If the clustering assignments were stable when an additional variable(s) was used for clustering, then the number of clustering variables could be safely reduced, and the clustering procedure would be more efficient.

It was determined that there was an insufficient amount of variance in the variable that measured which source the subject used last. The inclusion of this variable into the cluster analysis added very little information. This is due to the fact that most people use the retail store as their last source. Hence, this variable was not useful for separating clusters and was deleted from the cluster analysis.

In addition, the eleven binary variables representing the eleven three-source transitions were also found to add very little information to the clustering procedure. They also did not change the clustering assignments very much because sequences of three sources were used by only one-third of the subjects, while sequences of at least two sources were used by over one-half of the subjects. Furthermore, two two-source transitions contain most of the information that a three-source transition possesses. Thus, the addition of the eleven three-source transitions was somewhat redundant to the two-source transition variables. Hence, all of the three-source transitions were deleted from the cluster analysis.

Tryon and Bailey (1970) suggest that the classification of objects on a large number of dimensions or variables requires very large sample sizes. Since the primary sample in this study is only two hundred one, it is desirable to delete as many variables as possible that do not contribute significantly to the clustering assignments. The deletions explained above help to reduce somewhat the number of patterns that are possible, given the number of variables and variable values.

The Determination of the Number of Clusters

The literature review of consumer external search behavior provided some very loose guidelines to follow in terms of the number of different search behavior groups found in studies on the nature and extent of search. The number of consumer search groups ranged from three to six in most of these studies. However, this study examines the sequence of search and may yield quite different clusters than the other dimensions of search.

What are the guidelines for selecting the most appropriate number of clusters? Although one uses the hierarchical model to avoid deciding a priori the number of clusters desired in advance, most of the procedures for making decisions about the number of clusters necessary for best representing the data structure are heuristic in nature. The following criteria can be used to determine the most appropriate number of clusters:

1. Examine the squared Euclidean distance obtained when the clusters are combined at each stage. When there is a relatively large increase in the value of this coefficient, this indicates that clusters containing dissimilar objects are being forced to merge (Norusis, 1985). This is equivalent to the square root of Romesburg's (1984) E Index. The jump in the squared Euclidean distance has also been referred to as an "elbow" or as an indication of "tightness" of the clusters.
2. A general rule of thumb is that one can get no more than $n/50$ to $n/30$ reliable clusters from sample data (Lehmann, 1979).
3. Bergier (1978, p. 119) stated that analysis of the homogeneity within clusters and the stability of the clusters at different levels of clustering might be performed. If each cluster does not possess the same "core members" when the level of clustering is changed (for example, from four to five clusters), then the clusters are not stable. Bergier suggests that "This stability can be analyzed by performing a crosstabulation between two consecutive clustering levels."
4. The number of clusters should also be determined by the interpretability of the resultant clusters. Very small and very large clusters may not be useful for interpreting the data.

Given the above guidelines, we shall look first at the fusion coefficients (squared Euclidean distances) for each stage of the clustering procedure. Table 4 presents each of the non-zero coefficients together with its stage number and the amount of change in the coefficient.

An analysis of the changes in the fusion coefficients in Table 4 would suggest that five clusters is the most probable solution since the change in the fusion coefficient jumps from 12.99 to 18.94 when five clusters are merged into four clusters. The change in the coefficient prior to five clusters is normally less than two, but after the five-cluster solution, the change in the coefficient gets larger and larger more quickly. Hence, this jump in the squared Euclidean distance would indicate that five clusters is the most probable solution for this data set.

The rule of thumb that indicates that one can extract no more than $n/50$ to $n/30$ reliable clusters would indicate that this data set would yield between 4.02 and 6.7 reliable clusters based on a sample size of two hundred one.

Another indicator of the proper number of clusters is the stability of the clusters from one level of clusters to another. The core elements of the clusters appear to be very stable. Below is a representation of the changes in cluster membership from the level of three clusters to the level of six clusters.

In looking at Figure 10, one notices that there are three basic clusters in the data. The initial clusters 2

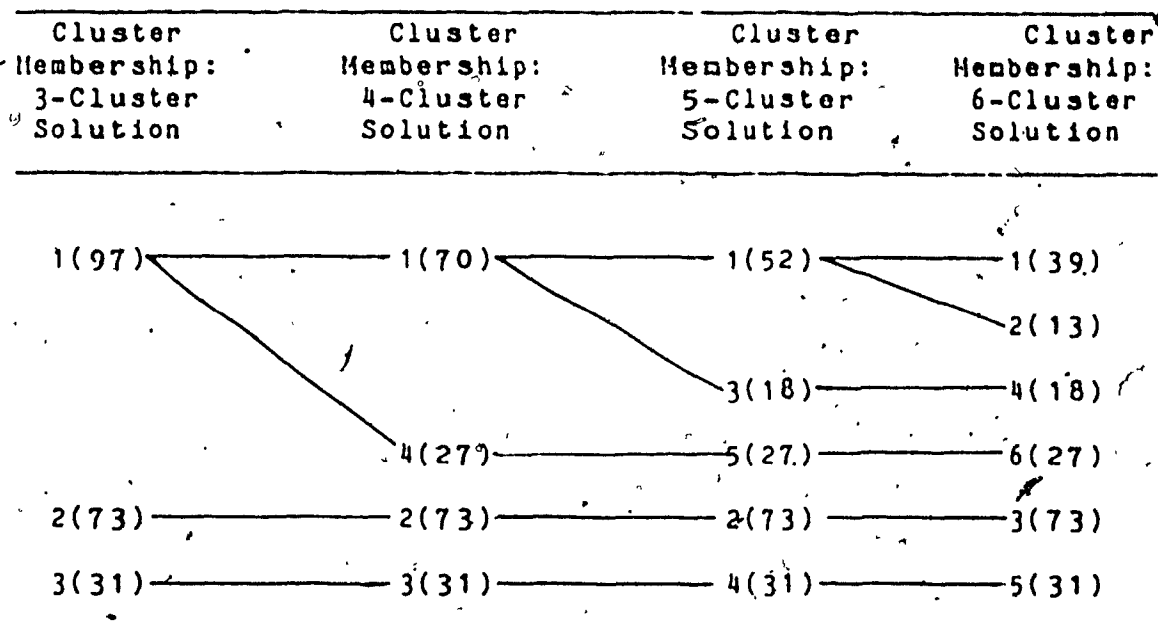
Table 4

Fusion Coefficients for Determining the Number of Clusters

Number of Clusters	Fusion Coefficient	Amount of Change
58	.199401	.199401
57	.398802	.199401
55	.797603	.199401
54	1.063471	.265868
52	1.711522	.348950
51	2.077089	.365567
49	2.954452	.478562
48	3.454452	.500000
46	4.574809	.620357
45	5.274209	.699400
43	6.673009	.699400
42	7.406142	.733133
40	8.939374	.783233
39	9.819134	.879760
38	10.705640	.886506
37	11.769108	1.063468
35	14.082632	1.196402
34	15.371065	1.288433
32	18.154282	1.418032
31	19.645676	1.491394
28	24.203918	1.558273
26	27.517883	1.714279
25	29.252244	1.734361
23	32.947800	1.897065
21	36.945770	2.098190
20	39.163818	2.218048
19	41.945526	2.781708
17	47.833969	2.961868
16	51.265671	3.431702
15	56.348343	5.082672
14	61.727203	5.378860
13	67.150391	5.423188
12	74.198441	7.048050
11	81.312027	7.113586
10	88.770111	7.458084
9	97.767624	8.997513
8	107.311203	9.543579
7	117.790970	10.479767
6	128.651123	10.860153
5	141.644730	12.993607
4	160.589645	18.944915
3	190.211380	29.621735
2	259.426025	69.214645
1	381.478760	122.052735

and 3 are extremely stable, while the initial cluster 1 breaks into two smaller clusters at each subsequent level. At the 6-cluster solution level, Cluster 2 seems to be too small to be of much use in later crosstabulation of cluster membership with other variables. Cluster 3 seems to have stabilized from the 5-cluster solution to the 6-cluster solution.

Figure 10. Changes in Cluster Membership at Different Clustering Levels.



Note. Number in parentheses represent the number of subjects in each cluster.

It appears from the various heuristics that are available that five is the most probable number of clusters in this data set. The jump in the fusion coefficient or the squared Euclidean distance, the $n/50$ to $n/30$ rule of thumb, the stability of the core clusters from the 4-cluster solution to the 5-cluster solution, and the creation of a

cluster) that is too small to be useful in the 6-cluster solution are all supportive of a 5-cluster solution.

Given the aforementioned evidence, particularly the fusion coefficient rule of thumb for determining an appropriate number of clusters as well as the stability of the 5-cluster solution illustrated in Figure 10, support is provided for Research Question One. Consumers in this study did exhibit a small number (five) of distinctly different prepurchase search strategies--as represented by the five-cluster outcome.

Identification of the Search Behavior Clusters

One test of the primary validity of a cluster analysis solution is whether the clusters that result from the analysis are interpretable and meaningful. In this case, it must be determined whether the sequential search strategies utilized by subjects who were clustered together are different from the strategies used by subjects in other clusters. Since the variables used for clustering were categorical in nature, it was not possible to calculate differences between the means of the resulting clusters on the variables used for clustering. Instead, nonparametric statistics were used to determine whether there were relationships in the data or whether the data was randomly distributed.

Non-parametric statistics were used because: (a) much of the data collected for this study were nominal data and (b) it was not known whether the observations were drawn from

normally distributed populations and whether the populations had the same variance (Siegel, 1956).

Crosstabulations were conducted between the assigned cluster membership and each of the clustering variables. The chi-square statistic, degrees of freedom, level of significance, Lambda, and the Uncertainty Coefficient are presented in Table 5. Each of these statistics is appropriate when both variables are nominal in nature.

Lambda is a measure of association based on the concept of the proportional reduction in error. Lambda can range in value from zero to one, with one occurring when prediction of the dependent variable can be made without error. A Lambda value of zero means that knowledge of the value of the independent variable yields no improvement in the prediction of the dependent variable. The Uncertainty Coefficient is very much like Lambda in that it represents "proportion by which 'uncertainty' in the dependent variable is reduced by knowledge of the independent variable" (Nie et al., 1975). Like Lambda, its values can range from zero to one; but they are calculated on the entire distribution, not on just the mode as Lambda is.

An inspection of Table 5 reveals that all the chi-square statistics were significant at the .05 level of significance. The crosstabulation of Transition Number Six and cluster membership, with a chi-square significance of .0122, added the least to the analysis and decreased the uncertainty of prediction of the dependent variable by less

Table 5

Summary Statistics of Crosstabulation of Cluster Membership with the
Clustering Variables

Cluster Membership with Clustering Variables	Chi-square	D.F.	Sign.	Lambda	Uncertainty Coefficient
Source Used First	324.786	24	.0000	.423	.481
Used One Source	169.951	4	.0000	.587	.534
Transition No. One	63.408	4	.0000	.062	.145
Transition No. Two	33.442	4	.0000	.044	.085
Transition No. Three	15.514	4	.0037	.064	.050
Transition No. Four	20.220	4	.0005	.058	.060
Transition No. Five	85.447	4	.0000	.142	.165
Transition No. Six	12.826	4	.0122	.043	.045
Transition No. Seven	21.931	4	.0002	.055	.075
Transition No. Eight	170.103	4	.0000	.241	.296
Transition No. Nine	42.194	4	.0000	.109	.117
Transition No. Ten	23.208	4	.0001	.065	.068

than 5%. The two variables representing the subject's first-used source and whether or not the subject used only one source possessed the highest values of Lambda and Uncertainty Coefficients. The cluster analysis algorithm apparently utilized these two variables to a great extent when clustering subjects. Other clustering variables that figured heavily into the clustering assignments were Transitions One, Five, Eight, and Nine. Therefore, evidence is provided by all of the significant chi-square statistics to support the general contention that the clustering variables figure significantly in the clustering assignments.

Cluster Profiles

However, it is necessary to look at the profile of each of the clusters to qualitatively assess whether there is some logic to the cluster solution. The development of a profile for each of the clusters will also aid in the pursuit of a tentative answer to Research Question 1b later, which investigates whether different prepurchase search strategies are related to other traits of the consumer. It is necessary to determine whether each of the resulting clusters possesses one or more unique trait or set of traits that makes it different from the other clusters.

Table 6 presents a summary of the dominant traits of each cluster. Note that the percentages for the first two clustering variables add down the columns, while the percentages add across the rows for the Transition

variables. This was done to magnify the differences between the clusters.

Table 6 reveals a great deal of information about the different sequential search strategies that were used by subjects in this study. Each of the five clusters will be profiled separately in the following paragraphs.

Cluster One--Variety Information Seekers (26%). The people in this cluster exhibited a variety of information-seeking sequences. Most began their information searches with either Consumer Reports or a Store Visit. They all used more than one information source. This group could be considered to have "catalogophobia," meaning they made very little use of the catalog source. They made extensive use of four sources: Store Visits, Newspaper, Friends and Relatives, and Consumer Reports magazine. This indicates that they utilized commercial, personal, and neutral sources of information. The most typical search sequence for this cluster is the two-source sequence beginning with the use of Consumer Reports magazine and ending with a personal visit to a retail store. They were twice as likely to use Consumer Reports before a store visit as after a store visit. They are more likely to consult with friends or relatives after a store visit than before a store visit, but exhibit both information-seeking sequences. They are also likely to check with a friend or relative after looking at newspaper advertising or Consumer Reports magazine.

Table 6

Profile of the Five-Cluster Solution Based on the Twelve ClusteringVariables

Clustering Variable	Cluster 1 (n=52)	Cluster 2 (n=73)	Cluster 3 (n=18)	Cluster 4 (n=31)	Cluster 5 (n=27)
Source Used First	44% #7 ^a 39% #4 15% #5 2% #2	84% #4 8% #5 8% #7	89% #7 11% #5	42% #6 26% #2 13% #3 10% #1 10% #8	52% #5 41% #2 4% #7 4% #6
One Source Used	None	All	None	55% yes 45% no	None
Trans. 1 ^c	None	None	53% ^d	6%	41% n=17 ^e
Trans. 2	None	None	33%	None	67% n=9
Trans. 3	69%	None	8%	15%	8% n=13
Trans. 4	89%	None	None	None	11% n=9
Trans. 5	10%	None	5%	5%	80% n=20
Trans. 6	67%	None	22%	None	11% n=9
Trans. 7	47%	None	29%	24%	None n=17
Trans. 8	10%	None	86%	5%	None n=21
Trans. 9	89%	None	None	11%	None n=18
Trans. 10	90%	None	None	None	10% n=10

^aThe percentages in this section represent the proportion of subjects in each cluster using a particular source first or last.

^bSource #s: #1=Magazine, #2=Catalog, #3=Yellow Pages, #4=Store Visit, #5=Newspaper, #6=Friend/Relative #7=Consumer Reports, #8=Phone call to Store.

^cTransitions: Trans. 1 = Catalog to Store Visit; Trans. 2 = Catalog to Newspaper; Trans. 3 = Store Visit to Friend/Relative; Trans. 4 = Store Visit to Consumer Reports; Trans. 5 = Newspaper to Store Visit; Trans. 6 = Newspaper to Friend/Relative; Trans. 7 = Friend/Relative to Store Visit; Trans. 8 = Consumer Reports to Catalog; Trans. 9 = Consumer Reports to Store Visit; Trans. 10 = Consumer Reports to Friend/Relative.

^dThe percentages in this section represent the proportion of that transition type exhibited in each cluster.

^en = number of cases which exhibited transition type.

Cluster Two--One-Source Shoppers (36%). This group appears to be quite homogeneous in that every subject in the group used only one information source. Eighty-four percent of the subjects in this cluster went directly to the retail store source and made a purchase decision. The remaining 16% used either the newspaper or Consumer Reports to make a purchase decision. This group represents the least amount of information source usage, and it was also the largest cluster out of the five clusters.

Cluster Three--Information Intensive Shoppers (9%). Almost ninety percent of this group began their information searches by using Consumer Reports magazine. Eleven percent of this group used the newspaper as their first information source. This group used the whole range of information sources including Catalogs, Store Visits, Newspaper, Friends/Relatives, and Consumer Reports. After looking at a catalog, they were likely to either visit a store or look at a newspaper. After looking at the newspaper, some consulted with a knowledgeable friend or relative. Some who consulted with a friend or relative subsequently visited a retail store. The dominant transition for this cluster was the sequence of using Consumer Reports and then using a catalog. This transition was exhibited by all of the subjects in this group. A store visit or the friend/relative source never followed the use of Consumer Reports. Furthermore, none of these subjects immediately preceded the Consumer Report source with a store visit. It appears that this group

typically begins its search with Consumer Reports magazine, followed by the use of store catalogs, and ends with a personal visit to the retail store.

Cluster Four--Advice Seekers (15.5%). The largest segment of this group (42%) consulted with a friend or relative as their first source. Fifty-five percent of this cluster utilized only one source in their information search, while 45% used more than one source. Of those people using only one source, the most typical single-source search involved the use of a catalog or a knowledgeable friend or relative. This would seem to indicate that some people are making the purchase decision based solely on the advice of a friend or relative. Approximately one in four people in this cluster used the catalog source as their first information source. Of those members of this cluster using more than one information source, the most typical sequence involved the use of a knowledgeable friend or relative followed by a personal visit to a retail store. Some of the members of this cluster also sought information from Consumer Reports magazine before making a purchase decision. It appears, then, that this group may be most dependent upon others for purchasing advice that is either neutral or personal in nature.

Cluster Five--Seller-Provided Information Seekers (13.5%). Fifty-two percent of this group used newspaper advertising as their first source, while forty-one percent used the catalog source first. Both sources are seller-

provided. More than half of the subjects in this cluster used the sequence involving the use of newspaper advertising followed by a store visit. Of those people who used the catalog source first, the second source is most likely to be a store visit or a look at newspaper advertising. While this group appears to like the print medium, they seem to prefer the commercial print medium over the neutral print medium (i.e., newspapers over Consumer Reports).

To summarize the five clusters as profiled using only the clustering variables:

1. Variety Information Seekers--26% of sample
2. One-Source Shoppers--36% of sample
3. Information Intensive Shoppers--9% of sample
4. Advice Seekers--15.5% of sample
5. Seller-Provided Information Seekers--13.5% of sample

Gordon (1981) discussed the two basic desiderata for clusters: (1) isolation of clusters and (2) cohesion within clusters. In looking at the profiles of the clusters, it appears that they each possess a distinct character and that the subjects within each cluster are reasonably homogeneous. Some of the clusters, however, do possess some subjects that do not seem to belong. This suggests that the clusters are well isolated, but that cohesion within some of the clusters may be questionable.

Given the profiles that were delineated above for the five clusters, it should be noted that further evidence is provided for Research Question Number One.

Evaluation of the Clusters

Since cluster analysis algorithms, for the most part, are atheoretic in nature, it is important to assess the resulting clusters to determine if they are valid and reliable. There are several ways to make these assessments. Below are listed a few of the techniques that were used to test the results of this study's cluster analysis:

1. One way to test for the reliability of the clusters is to use more than one clustering algorithm and to compare the cluster assignments of each method.

Gordon(1981) stated that one "shouldn't accept uncritically the results of a single clustering method."

2. Discriminant analysis is a frequently used technique for cross-validating cluster analysis results. Punj and Stewart (1983) suggested that half the sample be used in cluster analysis after which their cluster memberships would serve as the group membership variable in discriminant analysis. The discriminant functions that are derived are applied to the "hold out" sample. The "hold out" sample is entered into cluster analysis. The two cluster memberships resulting from the application of the discriminant functions and from the second

cluster analysis are then compared. This simple cross-validation is another technique to establish the reliability of the cluster solution.

3. "The ultimate test of a set of clusters is its usefulness. Thus, the user of cluster analysis should provide a demonstration that clusters are related to variables other than those used to generate the solution" (Punj and Stewart, 1983, p. 146). This is a method for establishing external validity. Numerous individual variables and information search variables that were not used as clustering variables can be used for this purpose.

Each of these procedures for establishing the reliability and validity of the cluster solution will be discussed next.

Comparison of Two or More Clustering Methods. If two or more clustering methods produce similar clusters, then the researcher can have more confidence in the structure revealed by the clusters. This congruence is evidence that the cluster assignments are less likely to be artifacts of the particular clustering method used and more likely to reveal the actual groups' structure.

The clustering method chosen for use in this study was Ward's hierarchical method of clustering. In order to determine if the results obtained when using this method were similar to other clustering methods, the sample data were entered into seven different hierarchical clustering

algorithms and one nonhierarchical algorithm. The clustering assignments from each of the seven clustering methods were compared with the clustering assignments of the Ward's method to determine what the percentage of agreement was between each pair of assignments. Table 7 presents the percentages, and indicates that the Average Linkage Between Groups (using the Squared Euclidean distance measure) had the highest percentage agreement with the Ward's method clustering assignments at 80%. The K-means nonhierarchical method resulted in clustering assignments that agreed with the Ward's method assignments 73% of the time, and the Average Linkage Within Groups Method (using the Cosine similarity measure) had a 69% agreement with the Ward's method.

Since the consistency of cluster assignments is moderately good, it suggests that the groups that were formed by cluster analysis are likely to reflect actual differences between the clusters rather than differences due to the mathematical formulas inherent in the algorithm.

Cross-Validation of the Data. In order to use the technique of simple cross-validation the following steps were followed:

1. Divide the sample into two equal parts by using the first one hundred cases as part one and the second one hundred one cases as part two.

Table 7

Agreement in Clustering Assignments Between Ward's Method
and Other Clustering Methods

Method Compared to Ward's	Percentage of Agreement
Average Linkage Between Groups	
Using Squared Euclidean distance measure	80%
Using Cosine Similarity Measure	62%
K-means Nonhierarchical Method	73%
Average Linkage Within Groups	
Using Cosine Similarity Measure	69%
Using Squared Euclidean distance measure	58%
Complete Linkage (Furthest Neighbor)	
Using Cosine Similarity Measure	63%
Using Squared Euclidean distance measure	60%
Single Linkage (Nearest Neighbor)	
Using Cosine Similarity Measure	42%
Using Squared Euclidean distance measure	36%
Centroid Clustering (UPGHC)	
Using Squared Euclidean distance measure	41%
Median Clustering (WPGHC)	
Using Squared Euclidean distance measure	39%

2. Take one-half of the sample and enter the appropriate clustering variables for each subject into a cluster analysis program.
3. Use the cluster membership assigned to each subject in the previous step as the dependent variable in a discriminant analysis. Use the clustering variables as the independent variables in the discriminant analysis.
4. Apply the discriminant functions obtained in the previous step to the "hold out" sample in order to assign each member of the "hold out" sample to a cluster.
5. Enter the appropriate clustering variables for each subject in the "hold out" sample into a cluster analysis program.
6. Compare the cluster memberships assigned to each subject in step 4 and step 5 above to see if the subjects were assigned to the same clusters.

As a result of this procedure, 85 out of the 100 subjects in the "hold-out" sample were classified into the same cluster by each method. It appears that Cluster Number 4 was responsible for most of the confusion between the two methods since it was involved in 11 out of the 15 misclassifications. In addition, the nonmatching classifications did not seem to be systematic; instead, the nonmatching cluster assignments seemed to involve all five clusters.

Summary of Findings Regarding Research Question One

The use of a cluster analysis algorithm has resulted in a five-cluster solution that appears to be reasonably reliable and valid. The five clusters represent five different types of prepurchase information-seeking strategies for a durable good.

It is now important to look more closely at the search sequences, which brings us to the next research question.

Research Question 1a:

A Closer Look at Search Sequences

Given the use of an information source in the prepurchase external search sequence, will other sources possess varying probabilities of occurring next in the sequence?

The purpose of this research question was to determine whether some information search sequences are more common and, therefore, more likely to occur than other sequences. If some sequences are more common, then the marketer will be better able to predict what the consumer will do next after an information source is used.

The Transition Matrix

In order to investigate this research question, it was necessary to construct a transition matrix. All transitions between two information sources were recorded in the transition matrix presented in Table 8. This table does not include the subject's transition from using no source to using the first source nor does it include the transition

Table 8

Transition Matrix of all Two-Source Sequences

FROM SOURCE NUMBER:	TO SOURCE NUMBER: ^a							
	1	2	3	4	5	6	7	8
1	0 0%	0 0%	0 0%	3 1.3%	0 0%	1 .4%	0 0%	0 0%
2	2 .9%	0 0%	1 .4%	17 7.2%	9 3.8%	4 1.7%	7 3.0%	0 0%
3	0 0%	1 .4%	0 0%	4 1.7%	1 .4%	0 0%	1 .4%	1 .4%
4	1 .4%	4 1.7%	1 .4%	0 0%	7 3.0%	13 5.5%	9 3.8%	4 1.7%
5	1 .4%	6 2.6%	1 .4%	20 8.5%	0 0%	9 3.8%	4 1.7%	2 .9%
6	1 .4%	2 .9%	1 .4%	18 7.7%	3 1.3%	0 0%	6 2.6%	2 .9%
7	0 0%	22 9.4%	3 1.3%	18 7.7%	3 1.3%	10 4.3%	0 0%	4 1.7%
8	0 0%	0 0%	0 0%	5 2.1%	0 0%	2 .9%	1 .4%	0 0%

Note. n(number of transitions) = 235; number of subjects using at least two sources = 111.

^aSource Numbers:

1 = magazine advertising

2 = catalogs

3 = Yellow Pages

4 = store visits

5 = newspaper advertising

6 = knowledgeable friend or relative

7 = Consumer Reports magazine

8 = telephone call to retail store.

from last source to purchase. These transitions were presented earlier.

The transition matrix illustrates clearly that the eight information sources were not used with the same frequency. Since greater than twenty percent of the cells in the matrix had expected frequencies of less than five, the chi-square statistic could not be calculated. However, one can see that some two-source sequences occurred quite frequently while several other two-source sequences did not occur at all during this study. While a statistical test cannot be used to answer this question, the data in the matrix do appear to be patterned and nonrandom.

We can also look at the frequency distribution of the first source used by all of the test subjects. This is the same as looking at the transition from before the purchase exercise to the first source used. The expected frequency of each source would be $1/8$, or 12.5%, and the degrees of freedom are 7. Table 9 depicts the frequency with which each of the sources was used as the first source in this study.

Table 9 lends support to the contention that each of the eight information sources does not possess an equal chance of occurring at each stage of the sequence. The store visit, Consumer Reports, and newspaper advertising were all sources that were used as the first source in proportions greater than expected (12.5%). The store visit,

Table 9

Frequency of Usage of Each Source as First Source

Source	# of Times Used First	% of Times Used First
Store Visit	81	40.3%
CONSUMER REPORTS	46	22.9%
Newspaper Advertising	30	14.9%
Catalogs	20	10.0%
Friends/Relatives	14	7.0%
Yellow Pages	4	2.0%
Phone Store	3	1.5%
Magazine Advertising	3	1.5%

Note. n = 201; df = 7; chi-square = 100.137; p < .001.

in particular, was heavily utilized by the subjects as the first source used in the purchase exercise.

We can also look at the frequency with which each source is used as the last source in the purchase exercise. This is the same as looking at the transition from last source used to the purchase decision. The degrees of freedom are seven, and the expected frequency of each source is $1/8$, or 12.5%. Table 10 presents the frequency with which each source is utilized as the last source in the study.

Table 10 further supports the contention that each of the sources does not possess an equal chance of being selected by shoppers at each stage of the search sequence. Once again, the store visit dominates in frequency of use by the test subjects, and this occurrence alone results in a significant chi-square statistic. However, it is understandable that the store visit would be used as the last source in the search sequence by such a large percentage of shoppers since that is where many purchase decisions are made and subsequently consummated.

Further Evidence of Differing Probabilities of Search Sequences

In trying to determine whether consumers exhibit distinct patterns of prepurchase information seeking, a multitude of search sequences were recorded. Whereas there were far too many different sequences to discuss each individually, a screening process was adopted to reduce the

Table 10

Frequency of Usage of Each Source as Last Source

Source	# of Times Used Last	% of Times Used Last
Store Visit	127	63.0%
Friend/Relative	20	10.0%
Catalogs	15	7.5%
<u>Consumer Reports</u>	14	7.0%
Newspaper Advertising	10	5.0%
Phone Store	8	4.0%
Magazine Advertising	4	2.0%
Yellow Pages	3	1.5%

Note. n = 201; df = 7; chi-square = 237.72; p < .001.

number of sequences for analysis. The less probable transitions at each step of the decision process were dropped from analysis. The criterion used for deleting a search sequence was the 1% pure chance criterion. That is, if a transition did not comprise at least 1% of all the transitions at that stage in the decision process then it was deleted from further analysis. For example, since the transition from source 1 to source 6 did not comprise 1% of the 201 transitions that took place at stage 1 (transition between first source and second source/or purchase), it was deleted from further analysis.

An analysis of the choice of the first source in the search process resulted in the elimination of all of the search sequences that began with magazine advertising, Yellow Pages, and a telephone call to a retail store. This reduced the total number of transitions from 201 to 191, and the latter figure is the figure upon which all succeeding calculations will be based. Approximately 42% of the most frequently traveled paths began with a visit to a retail store, 24% began by reading Consumer Reports magazine, 15.7% began by reading newspaper advertisements, 10.5% began by looking at catalogs, and 7% began by asking a knowledgeable friend or relative for advice.

The paths that began with each of these five information sources will be presented next. Only those possessing a probability of occurring of one percent or more will be discussed. The search paths that begin with

catalogs, a personal visit to a retail store, newspaper advertising, a knowledgeable friend or relative, and Consumer Reports magazine are illustrated graphically in Appendix C. Out of all of these information search paths, twenty paths had a probability of occurring greater than one percent. The twenty most probable paths are presented in Table 11.

Although the data are presented somewhat differently than in previous tables, once again the most popular way to shop appears to be to make a personal visit to a retail store(s) and then to make a purchase decision. This was the overwhelming search sequence choice comprising over 36% of the most probable paths. This search path was used exclusively by members of the One-Source Shopper Cluster. The next most frequently travelled search path involved seeking information from a knowledgeable friend or relative and making a purchase decision based upon the information acquired. This had a probability of 5-3/4%. About 5-1/4% of the most frequently exhibited search paths involved the use of catalogs followed by a purchase decision. Both of these paths were followed exclusively by members of the Advice-Seeker cluster.

It is reasonable to expect that the three most frequently used information search paths involved only one information source--a store visit, or friend/relative, or a catalog. Most consumers will try to make decisions as efficiently as possible, and this may involve the

Table 11

The Twenty Most Common Complete Information Search PathsSource Sequence

Percentage of Occurrence	First Source	Second Source	Third Source	Fourth Source	Cluster
36.640%	4				2
5.738	6				4
5.235	2				4
5.234	5----->	4			5
5.225	7				2
3.667	7----->	4			1
3.660	5				2
3.147	7----->	2----->	4		3
1.571	2----->	4			5
1.568	7----->	2----->	6----->	4	3
1.567	5----->	6----->	4		1
1.052	2----->	5----->	4		5
1.052	4----->	6----->	7----->	8	1
1.052	4----->	6			1
1.047	7----->	6----->	4		1
1.047	7----->	6			1
1.047	6----->	4			4
1.045	5----->	2----->	4		5
1.036	4----->	7----->	6		1
1.036	4----->	7			1

Note. Source #2 = catalogs
Source #4 = personal visit to retail store
Source #5 = newspaper advertising
Source #6 = knowledgeable friend or relative
Source #7 = Consumer Reports magazine
Source #8 = telephone call to retail store

acquisition of "just enough" information to feel comfortable making a purchase decision. In addition, the probability of using combinations of information sources would most likely be lower than the probability of using just one information source.

With only a slightly lower probability of occurring is the search sequence of using newspaper advertising, making a personal visit to a retail store, and then making a purchase decision. This search sequence was utilized exclusively by members of the Seller-Provided Information Seeker cluster. With approximately the same probability of occurring is the information search involving the use of Consumer Reports magazine and a subsequent purchase decision. Persons using only Consumer Reports before making a purchase decision were members of the One-Source Shoppers group. Both of these search sequences have a probability of approximately 5.24%.

The search sequence starting with Consumer Reports, leading to a retail store visit and then a purchase decision was the sixth most frequently travelled search path with a probability of 3-2/3%. This search sequence was used exclusively by members of the Variety Information Seeker cluster. About the same proportion of people used newspaper advertising as their sole information source, and then made a purchase decision. These consumers were members of the One-Source Shopper group. Slightly over 3% of the most frequently exhibited search paths involved the use of Consumer Reports magazine first, catalogs second, and a

personal visit to a retail store third. These consumers were all members of the Information Intensive Shopper cluster.

The remainder of the twenty most frequently used information search paths each comprise from about one to one and one-half percent of the search paths. Three search paths each held about 1-1/2% of the paths. One of these paths began with the use of a catalog, led to a personal visit to a retail store and a purchase decision. This path exemplified the Seller-Provided Information Seeker group. The second path, and one of the longest, began with Consumer Reports magazine which led to the use of catalogs, then to a knowledgeable friend or relative, and finally to a personal visit to a retail store. This long path was exhibited by members of the Information Intensive Shopper category. The third path began with the use of newspaper advertising, followed by the use of a knowledgeable friend or relative, which led to a personal visit to a retail store. This longer-than-average search path was found among members of the Variety Information Seeker cluster.

The last group of the most frequently travelled search paths all comprise about one percent of the most probable paths. One of these began with the use of a catalog, followed by the use of newspaper advertising and a personal visit to a retail store. This was characteristic of the Seller-Provided Information Seeking group. Another path began with a personal visit to a retail store followed by

the use of a knowledgeable friend or relative. While this path ended here, another path used these two sources followed by the use of Consumer Reports and a telephone call to a retail store. Both of these paths were utilized by members of the Variety Information Seeker cluster.

Two paths began with the use of Consumer Reports magazine, followed by the use of a knowledgeable friend or relative. While one of these paths ended there, the other continued on to a personal visit to a retail store. Still another path began with the use of a knowledgeable friend or relative, leading to a personal visit to a retail store and then to a purchase decision. These two paths also were found exclusively among Variety Information Seekers.

Two paths began with a personal visit to a retail store followed by the use of Consumer Reports magazine. One of these paths ended in a purchase decision while the other continued on to the use of a knowledgeable friend or relative. Both of these search sequences were exhibited by Variety Information Seeker Cluster members. The last of the twenty most probable search paths began with the use of newspaper advertising, which led to the use of catalogs, and finally to a personal visit to a retail store. This search sequence was carried out by consumers in the Seller-Provided Information Seeker category.

All of the most probable information search paths are presented for inspection in Appendix C. The percentage to the right of each branch stands for the proportion of the

total search sequences represented by that particular branch. The numbers in the circles represent the information source being used at each step in the search process. The numbers on the branches stand for the proportion of searches that proceeded down each branch from every decision point.

Summary of Findings Regarding Research Question 1a

Research Question 1a inquired as to whether certain sources possessed greater probabilities of occurring after certain other sources in prepurchase search sequences for durable goods.

The transition matrix of two-source sequences, while not subjected to a statistical test, exhibits definite patterns of source usage. The fact that certain information sources are more likely to be used as the consumer's first source or last source indicates greater probabilities of certain sources being utilized at different stages in the search.

Whereas much of the data analysis was based on the presence or absence of two-source sequences, one may wonder whether the five resulting clusters are associated with consumers' full search sequences. In an attempt to clarify this issue, the full information search sequences were investigated further. This investigation resulted in twenty of the most probable complete search paths. Each of these twenty search paths was uniquely exhibited by the members of only one cluster. Hence, this further supports Research

Question One regarding the existence of distinctly different sequential search strategies and Research Question 1a regarding varying probabilities of source usage in the search sequence preceding durable goods purchasing.

Research Question 1b: Are Sequential Search Patterns
Associated with Other Variables?

Is the use of different sequential search patterns for a durable good related to one or more demographic, socioeconomic, and/or psychological variable(s)?

Now that it has been established that the five-cluster solution is reasonably reliable, the next task is to determine if the clusters are meaningful and useful in a marketing context. In order to do this, it must be determined whether other variables that were not used in the clustering process are related to cluster membership. We will first look at the other variables that were descriptive of each subject's search, but which were not used as clustering variables. Then we will see how individual variables, such as attitudinal and experiential variables, are related to cluster membership. By analyzing the data to determine whether these individual and other search variables are related to cluster membership, Research Question 1a can be investigated.

Search Variables and Cluster Membership

Table 12 presents a list of variables used in the study, and depicts whether there was a significant

Table 12

Relationships Found Between Cluster Membership and Other
Search Variables in This Study

Cluster Membership crossed with:	Chi-Square	D.F.	Significance	Lambda	Uncertainty Coefficient
Magazine Usage	13.00	4	*	.029	.042
Number of Magazines Used	30.87	12	**	.044	.073
Catalog Usage	92.11	4	***	.217	.255
Number of Catalogs Used	108.14	16	***	.156	.243
Yellow Page Usage	14.20	4	**	.036	.050
Number of Yellow Pages Used	24.44	12	**	.050	.068
Store Visits Made	37.23	4	***	.082	.078
Number of Store Visits	56.18	32	**	.103	.084
Newspaper Usage	57.67	4	***	.167	.135
Friend or Relative Usage	50.47	4	***	.140	.158
Number of Friends/Relatives used	75.46	36	***	.152	.166

Table 12 continued

Cluster Membership crossed with:	Chi-Square	D.F.	Significance	Lambda	Uncertainty Coefficient
Consumer Reports Usage	101.78	4	***	.374	.261
Telephone Usage	15.61	4	**	.069	.053
Number of Stores Telephoned	24.80	24	n.s.	.069	.075
Total Questions Asked at Stores	115.76	76	**	.091	.137
Total Questions Telephoned	40.76	32	n.s.	.083	.097
Number of Sources Used	190.20	20	***	.366	.402
Depth of Search Index	126.81	60	***	.165	.174
Total Chunks of Info. Used	175.31	116	***	.164	.200
Store Where TV Bought	37.68	32	n.s.	.030	.059
Brand Bought	47.54	44	n.s.	.065	.064
Source Used Last	86.94	28	***	.144	.179

Note. n.s. denotes not significant at .05 level.
 * $p < .05$ level. ** $p < .01$ level. *** $p < .001$ level.

nonparametric relationship between cluster membership and each search variable.

Table 12 indicates that cluster membership is related to some of the variables that describe the subject's content and depth of search and is not related to others. Those variables that have both significant chi-square (at least .001 level) and a relatively high Lambda or Uncertainty Coefficient (of at least .08) will be selected for discussion. It should be noted here that the clustering variables were primarily variables describing the search sequence (i.e., the transitions between two sources). Hence, some of the source variables may be highly correlated with some clusters and not others because they comprise part of the transitions used for clustering purposes. It is interesting to note that the choice of store from which to purchase and the brand choice were not significantly related to cluster membership.

The three variables with the highest Lambda and Uncertainty Coefficient values are the number of different information sources used during the search, whether the Consumer Reports source was used, and whether the catalog source was used. The number of sources used seemed to reduce uncertainty more than richer measures of search, such as the depth of search index and the total chunks of information requested. Other important variables seemingly related to cluster membership include whether the subjects used the newspaper as an information source, whether the

subjects used a friend or relative as an information source, and whether the subjects used the store visit information source. Also related to cluster membership is the source used last in the search sequence. To reiterate, all of these sources can be shown to be related to the clustering variables themselves because the information source variables are components of the transitions variables, and the depth of search variables are related to the binary variable which indicated whether or not only one information source was used.

For those search variables that are ordinal in nature, the Median Test can be conducted to determine in a different way whether the relationship between each search variable and cluster membership is significant. It also allows one to determine whether each cluster contains a higher or lower proportion of people possessing a particular characteristic. The search variables measured at least ordinally were each jointly classified with cluster membership using the Median Test, and the results are presented in Table 13.

Table 13 indicates that differences between the clusters on the search variables appear to be genuine, as is evidenced by all variables being significant at the .05 level at a minimum. Next, we shall look at how the clusters appear on each variable relative to the median. This will be presented in Table 14.

In looking at Table 14, one is able to see not only which variables help to distinguish between the clusters,

Table 13

Results of Applying the Median Test to Cluster Membership
and Search Variables

Cluster Membership with:	Median	Chi-Sq.	D.F.	F
Number of Catalogs Used	0	92.11	4	**
Number of Stores Visited	2	12.22	4	*
Number of Friends/ Relatives Used	0	50.47	4	**
Total Questions Asked at Stores	4	11.85	4	*
Total Questions Asked of Friends/Relatives	0	50.47	4	**
Number of Sources Used	2	89.80	4	**
Depth Index of Source Usage	3	48.24	4	**

NOTE: Number of Magazines used, Yellow Pages used, Stores Telephoned, and Total Questions Telephoned to Stores could not be tested due to too many cells with less than 5 frequency.

* $p < .05$ significance level. ** $p < .001$ significance level.

Table 14

Differences between the Clusters on Search Variables As Distinguished by the Median

Search Variable	Median	C1	C2	C3	C4	C5
# of Magazines	0	-	-	-	-*	-
# of Catalogs	0	-	-	+	-	+
# of Yellow Pages	0	-	-	-	-*	-
# of Stores Visited	2	-*	-	-	-	-*
# of Friends/ Relatives	0	-*	-	-	-*	-
# of Stores Phoned	0	-*	-	-	-	-
Total # of Questions Asked at Store	4	+	-	-	-	+
Total # of Questions Asked over Telephone	0	-*	-	-	-	-
Total # of Questions Asked to Friends/Rel's	0	-*	-	-	-*	-
Number of Sources Used	2	+	-	+	-	-
Depth of Search Index	3	+	-	+	-	+

+ denotes that more people in that cluster were higher than the median than lower or equal to the median value.

- denotes that more people in that cluster were equal to or lower than the median than higher than the median value.

*In instances where all clusters had the majority of people falling at the median or lower, an asterisk indicates that the cluster had a higher proportion of its membership above the median than the other clusters had.

but also how they distinguish between the clusters. First we will look at those variables where there are clearly more subjects above the median than equal to or below the median.

First, it is clear that Clusters 1 and 3 possess more people who use more than two information sources (the median number of information sources used). On the Depth of Search variable, Clusters 1, 3, and 5 (Variety Information Seekers, Information Intensive Shoppers, and Seller-Provided Information Seekers, respectively) contain more people who conduct more in-depth searches than people who conduct searches at the median level or lower. More members of Clusters 1 and 5 ask more than the median number of questions at stores that they visit. More members of Clusters 3 and 5 use more than the median number of store catalogs than less than the median number of catalogs.

Next, we will look at those clusters which had the highest proportion of people in the greater-than-median category, but the proportion in all of these cases is less than fifty percent. Cluster 1 (Variety Information Seekers) had the highest proportion of people who telephoned stores and who asked the most questions over the telephone. Clusters 1 and 5 (Variety Information Seekers and Seller-Provided Information Seekers) had the highest proportion of people who visited more than the median number of stores. Clusters 1 and 5 had the highest proportion of people who used greater than the median number of friends and relatives as information sources; they also asked more than the median

number of questions of these personal sources. Finally, Cluster 4 (Advice Seekers) had the highest proportion of people who read more than the median number of magazines and more than the median number of yellow page headings.

Up to this point we have seen how the resultant clusters differed on the search variables used for clustering as well as on other search variables that pertain to the content and depth of search. We will now examine the individual variables to determine if any of this type of external variable are related to cluster membership.

Individual Variables and Cluster Membership

It is important to determine if the five clusters in the chosen clustering solution are related to variables other than those used for arriving at the cluster solution. This is necessary for providing evidence of external validity, that is, to show that the resulting clusters are meaningful, interpretable, and useful. The cross-tabulation of individual variables with cluster membership is also important for investigating Research Question 1b, which is an inquiry about relationships between sequential patterns of search and individual variables. Hence, we will now examine the relationships between the individual variables and cluster membership.

First, we will examine those individual variables that are only nominal in nature. They were each cross-tabulated with cluster membership, and then the chi-square statistic, Lambda, and Uncertainty Coefficient were calculated for each

pair. Table 15 presents the results of the cross-tabulations between cluster membership and the individual variables.

Table 15 reveals that only three of the variables measuring demographic characteristics and purchasing experience were significant at at least the .05 level. Since there are 24 variables in this table, 1.2 variables could be expected to be significant purely by chance. The results, therefore, must be interpreted in this light.

The first variable in Table 15 to possess a significant chi-square statistic is the Age of the Subject's Youngest Child variable. An inspection of the joint occurrence of cluster membership with the age of the subject's youngest child reveals that persons in Clusters 2 and 4 seem to have older children, while persons in Clusters 1, 3, and 5 tend to have younger children who were twelve and under. The second variable in Table 15 to possess a significant chi-square statistic (at .001 level) is the variable which measured highest educational level attained. It appears that those persons in Cluster 2 (The One-Source Shoppers) possess the most people at the lower educational levels. Persons in Cluster 4 (Advice Seekers) and Cluster 5 (Seller-Provided Information Seekers) were most likely to hold a high school diploma. Subjects in Cluster 1 (Variety Information Seekers) and Cluster 3 (Information Intensive Shoppers) were most likely to have a bachelors or an advanced degree.

Table 15

Cross-Tabulation Between Cluster Membership and Individual Variables

Cluster Membership	Chi-Square	D.F.	F	Lambda	Uncertainty Coefficient
Sex	2.05	4	n.s.	.022	.005
Age	43.63	36	n.s.	.055	.064
Marital Status	16.91	12	n.s.	.032	.044
Number of Children	17.55	16	n.s.	.041	.031
Age of Youngest Child	21.25	12	*	.125	.053
Educational Level	55.39	24	***	.079	.090
Number of Wage Earners in Home Household	12.50	12	n.s.	.000	.030
Income	19.37	20	n.s.	.039	.031
Own Car	3.65	4	n.s.	.000	.016
Type of Decision Process	44.25	20	**	.115	.081
Own TV	1.59	4	n.s.	.000	.004
Own Color TV Brand Bought Last	2.00	4	n.s.	.000	.006
Ever Bought at:	60.03	76	n.s.	.037	.085
Store 1	1.75	4	n.s.	.000	.008
Store 2	.52	4	n.s.	.000	.001
Store 3	6.99	4	n.s.	.000	.016
Store 4	2.89	4	n.s.	.014	.006
Store 5	2.95	4	n.s.	.000	.013
Store 6	4.42	4	n.s.	.000	.020
Store 7	6.67	4	n.s.	.000	.018
Store 8	3.58	4	n.s.	.000	.016
Store Loyalty	8.68	4	n.s.	.000	.021
Brand Loyalty	4.36	4	n.s.	.044	.010
TV Purchase Experience	22.56	16	n.s.	.000	.045

Note. n.s. denotes not significant at at least .05 level.

* $p < .05$ level; ** $p < .01$ level; *** $p < .001$ level.

The third significant relationship in Table 15 was between cluster membership and the subject's perception of his/her decision process. Six descriptions of the search/decision process were listed, and the subject had to choose the one that most closely described his/her decision process. Below is a list of the decision processes:

1. Knew before started the computer simulation which store from which s/he would buy and which brand s/he would buy (7.7%).
2. Knew before started the computer simulation which brand s/he would buy, but had to decide from which store to buy (16.0%).
3. Knew before started the computer simulation from which store s/he would buy, but had to decide on the brand (10.8%).
4. After searching, chose store and then chose brand (9.8%).
5. After searching, chose brand and then chose store (26.3%).
6. After searching, chose brand and store simultaneously (29.4%).

From the crosstabulation, it appears that subjects in the two clusters that exhibited the shortest search sequences (i.e., Clusters 2 and 4) were most likely to have made up their minds about either the store or brand or both before searching for new information. Hence, this may account for some of the lack of depth and diversity in their

searches. Subjects in Clusters 1 and 3 (The Variety Information Seekers and the Information Intensive Shoppers, respectively) tended to search, make a choice about what brand to buy, and then make a choice about the store from which to buy. Subjects in Cluster 5 (Seller-Provided Information Seekers) were most likely to search and make the store and brand choice simultaneously. It appears that the brand and store choices cannot be made separately and/or cannot be perceived as distinctive choices after the fact by a great many people.

Next, we will look at some of the demographic variables presented above that were measured on an ordinal scale. For these variables it is appropriate to use the median test to determine if some clusters possess more subjects above or below the median than other clusters. Table 16 presents these results.

Table 16 reveals that Cluster 2 (The One-Source Shoppers) possessed more people who were older than the median age category than were equal to or younger than the median age. The median age category was 30 to 34. This cluster also tended to have more people with children who were over twelve years of age, rather than twelve and younger. While the Number of Children variable was not significant for this test, Cluster 2 also had more people with more children than the median number of children (2).

The clusters with longer search sequences (Clusters 1 and 3) did indeed have a majority of subjects who had

Table 16

Results of the Median Test Applied to Cluster Membership and Ordinal Variables

Ordinal Variable	C1	C2	C3	C4	C5	Chi Square	F	Median
Age	-	+	-	-	-	10.05	*	3
Number of Children	-	-	-	-	-	4.80	n.s.	2
Amt of TV Purchasing Experience	-	-	-	-	-	5.73	n.s.	1
Age of Youngest Child	-	+	-	-	-	13.85	**	2
Educational Level	+	-	+	-	-	23.16	***	3
Household Income	-	-	+	-	-	1.55	n.s.	3

Note. n.s. denotes not significant at at least .05 level.
 * $p < .05$ level; ** $p < .01$ level; *** $p < .001$ level.

attained the higher education levels. While the Household Income variable did not prove to have a significant relationship with cluster membership on the median test, the majority of members of Cluster 3 had household incomes greater than the median level, which was \$20,000 to \$29,999.

Finally, the Amount of Purchasing Experience variable was not found to have a significant relationship with cluster membership either. The median number of times that the subjects had participated in a color television purchase decision was one; and the analysis showed that a higher proportion of Cluster 2 members than the other clusters had been involved in such a purchase at least twice.


The tables and analyses presented provide some enrichment to the profiles that are being developed for the five clusters. The next section will present the analyses of the relationships between attitudinal variables and cluster membership. This study looked at the subjects' attitudes toward the following items:

1. the ease of acquiring information from each source,
2. the usefulness of each of the information sources,
3. how knowledgeable the subject believed s/he was regarding: (a) the color television product category and (b) the stores that sell color televisions,
4. how confident the subject felt regarding his/her ability to evaluate: (a) the products in the color

television product category and (b) the stores selling color televisions,

5. the degree of similarity/difference between: (a) color television brands available in the market place and (b) stores offering color televisions in the area,
6. the importance of searching until finding just the right brand,
7. the degree to which the subject enjoys/does not enjoy shopping,
8. how important it was to economize in the television purchase decision,
9. how important the brand's reputation was in the subject's purchase decision,
10. how important the store's reputation was in the subject's purchase decision.

All of the attitudinal items were asked on a scale from 1 to 7, with 1 representing the positive end of the scale. Since these scales possess an underlying continuous distribution and are at least ordinal measurements, the Kruskal-Wallis one-way analysis of variance by ranks is an appropriate test of whether the differences between the clusters are genuine differences or merely due to chance variations between random samples taken from the same population. The Kruskal-Wallis test is a nonparametric test, and it is more efficient than the median test since it uses more of the information that has been collected. The



procedure results in a chi-square statistic, and the significance level can be calculated with a correction for ties in rank. The results of these calculations are presented in Table 17. This table includes the mean ranks for each cluster, the means for each cluster, and the overall mean of the primary sample in addition to the chi-square and its significance level.

Table 17 reveals further information about the differences between the five clusters. Out of twenty-seven attitudinal items, eight of them were significant at at least the .05 level. This is far greater than the 1.35 items that would be significant due purely to chance. Four information sources exhibited significant differences between the clusters with respect to the ease of acquiring information from them. Two information sources exhibited significant differences with respect to the perceived usefulness of the information source. There was found to be a significant difference between the clusters on the importance of making just the right purchase decision as well as on the importance of store reputation in the purchase decision.

With respect to the subjects' attitudes toward the ease of acquiring information from the catalog source, it appears that the clusters rating catalogs as being easier to use made very little use of the catalog source (i.e., Clusters 1 and 2). Subjects in Clusters 3, 4, and 5 used the catalog source to the greatest extent, yet they rated the catalog

Table 17

Kruskal-Wallis One-Way Analysis of Variance by Ranks of Cluster
Membership and Attitudinal Variables

Attitudinal Variables	Chi-Square	P	M E A N - R A N K S				
			C1	C2	C3	C4	C5
<u>Ease of Acquiring Information:</u>							
Magazine Mean	8.15	n.s.	100 2.85	94 2.71	126 3.50	115 3.19	87 2.41
Overall Mean =	2.85						
Catalogs Mean	11.19	*	115 4.17	85 3.23	108 4.00	96 3.55	117 4.26
Overall Mean =	3.73						
Yellow Pgs Mean	13.99	**	90 2.62	105 3.07	68 1.78	109 3.03	125 3.48
Overall Mean =	2.89						
Store visit Mean	12.30	*	107 3.25	88 2.71	128 4.00	90 2.71	119 3.70
Overall Mean =	3.10						
Newspaper Mean	12.11	*	106 2.17	103 2.10	119 2.17	104 2.16	70 1.19
Overall Mean =	2.01						
Friend/rel Mean	1.60	n.s.	106 2.77	96 2.53	111 2.72	99 2.55	100 2.44
Overall Mean =	2.60						
Cons. Reports Mean	3.81	n.s.	107 3.73	97 3.44	115 4.06	87 3.19	107 3.74
Overall Mean =	3.57						
Telephone Mean	2.79	n.s.	100 2.67	96 2.60	120 3.17	104 2.65	101 2.56
Overall Mean =	2.67						
<u>Usefulness of Source:</u>							
Magazine Mean	18.38	**	121 4.25	98 3.52	112 3.89	100 3.52	64 2.44
Overall Mean =	3.60						

Attitudinal Variables	Chi-Square	F	MEAN RANKS				
			C1	C2	C3	C4	C5
Catalogs Mean Overall Mean = 4.26	2.11	n.s.	109 4.54	95 4.07	104 4.39	97 4.16	103 4.30
Yellow Pgs Mean Overall Mean = 2.83	14.67	**	88 2.58	98 2.73	81 2.28	120 3.29	127 3.44
Store visit Mean Overall Mean = 4.61	7.12	n.s.	99 4.58	106 4.73	101 4.67	79 3.84	117 5.19
Newspaper Mean Overall Mean = 1.94	6.18	n.s.	102 2.04	100 1.93	124 2.22	103 2.06	85 1.44
Friend/rel Mean Overall Mean = 2.80	1.56	n.s.	103 2.83	98 2.75	114 3.06	96 2.77	103 2.70
Cons. Reports Mean Overall Mean = 4.26	6.96	n.s.	105 4.37	99 4.18	130 5.11	86 3.87	97 4.19
Telephone Mean Overall Mean = 3.32	3.91	n.s.	97 3.19	106 3.42	117 3.83	100 3.29	87 2.96
<u>Knowledge of:</u>							
Color TVs Mean Overall Mean = 3.75	7.22	n.s.	111 4.02	97 3.62	123 4.39	95 3.55	85 3.37
Stores Mean Overall Mean = 3.70	4.21	n.s.	104 3.79	98 3.63	123 4.28	100 3.65	89 3.37
<u>Confidence in Ability to Evaluate:</u>							
Color TVS Mean Overall Mean = 3.35	6.36	n.s.	95 3.19	95 3.21	121 3.94	117 3.77	97 3.15

Attitudinal Variables	Chi Square	F	MEAN RANKS				
			C1	C2	C3	C4	C5
Stores Mean Overall Mean = 3.16)	4.68	n.s.	96 3.00	99 3.16	103 3.22	120 3.55	93 2.96
Importance of Making the Right Decision: Mean Overall Mean=2.69	10.47	*	110 2.87	86 2.33	109 2.83	98 2.52	122 3.41
Perception of Brand Difference: Mean Overall Mean = 3.52	2.55	n.s.	100 3.46	95 3.38	100 3.39	110 3.81	111 3.74
Perception of Store Difference: Mean Overall Mean = 3.81	7.62	n.s.	100 3.81	98 3.71	76 3.11	121 4.39	104 3.89
Enjoyment of Shopping: Mean Overall Mean = 3.34	2.80	n.s.	106 3.48	100 3.38	103 3.28	87 2.84	110 3.59
Importance of Saving \$: Mean Overall Mean = 3.04	3.70	n.s.	106 3.12	93 2.81	96 2.94	114 3.18	102 3.04
Importance of Brand Reputation: Mean Overall Mean = 2.08	4.39	n.s.	93 1.75	99 2.14	101 2.06	118 2.74	101 1.78
Importance of Store Reputation: Mean Overall Mean = 2.46	9.80	*	109 2.54	85 2.08	115 2.83	112 2.90	107 2.56

Note. n.s. denotes not significant at at least .05 level.

* $p < .05$ level; ** $p < .01$ level.

source as being difficult to acquire information from. It appears to be just the reverse for the Yellow Pages. Clusters 1, 3, and 4 used the Yellow Pages the most, and they also rated the Yellow Pages as being easier to acquire information from than the other clusters. Clusters 2 and 4 rated Store Visits as being an information source that is easy to acquire information from (compared to the other clusters), yet these two clusters used the Store Visit source the least.

The main difference with respect to attitude toward the ease of acquiring information from the newspaper was between Cluster 5 and all the other clusters. Subjects in Cluster 5 quite clearly rated the newspaper as an information source from which it is very easy to acquire information. It should be noted, however, that the newspaper source was ranked by all the clusters as being relatively easy to acquire information from, as the overall mean of 2.01 illustrates. This is the lowest overall mean of all eight information sources, indicating that people generally believe that the newspaper is the most accessible source of purchase information.

With respect to the subjects' attitudes toward the usefulness of magazines as an information source, it appears that members of Cluster 5 rated this source considerably higher than the other clusters rated it. This means that Cluster 5 subjects rated the magazines as being more useful than the other clusters rated them; however, none of the

Cluster 5 subjects used the magazine source during their prepurchase information searches!

The results from rating the usefulness of the Yellow Pages are not as clear. Whereas only members of Clusters 1, 3, and 4 used the Yellow Pages during their searches, members of clusters 1 and 3 did rate the Yellow Pages as being quite useful, but members of Cluster 4 did not. Members of Cluster 2 rated the Yellow Pages as being a relatively useful information source, but none of the subjects in this cluster used the Yellow Pages during the purchase simulation,

Thus, it appears that one might perceive a source as being easy to acquire information from or very useful, yet s/he may choose NOT to use that source. This may be due to the fact that some sources might be used by inexperienced shoppers and other sources might be used by more experienced shoppers. For example, an experienced shopper may find it unnecessary to use the Yellow Pages to find out which stores sell a particular type of product, but the same shopper might still rate the Yellow Pages as a useful information source. Another shopper might consider the magazine source to be an easily acquired information source, but s/he might not use this source just because it is easily acquired. The source must also possess information that is relevant to the shopper's informational needs.

It appears that members of Clusters 2 and 4--the two clusters representing the shortest search sequences--felt

that it was MORE important to make just the right purchase decision when shopping for a color television than the other clusters. This result is not what one would expect; rather, one would expect that those people who invest the most time and energy in their searches would feel that it is most important to find just the right brand. Perhaps the people in Clusters 2 and 4 believe that one need not search very far to find just the right brand; maybe they have such deep faith in the information source(s) chosen that they believe the source will lead them to just the right brand or perhaps their brand loyalty leads them to believe that they have found just the right brand.

The last significant relationship in Table 17 was between cluster membership and the importance of store reputation in the purchase decision. It appears that Cluster 2, which contained all one-source shoppers, placed the most importance on store reputation. This is consistent with the fact that 84% of the subjects in this cluster used the Store Visit source as their only source; hence, it appears that they probably put a great deal of emphasis on the stores' reputations before choosing a store in which to shop.

Summary of Findings Regarding Research Question 1b

Given the large number of variables that possess a relationship with the five search clusters that were generated, support is provided for answering Research Question 1b in the affirmative. Those variables that were

found to be significantly related to the sequential search strategies included: a) twenty search variables not used in the clustering procedure, b) age of youngest child, c) highest education level achieved, d) type of decision process used, e) age of respondent, f) attitude about ease of acquiring information from some sources, g) attitude about perceived usefulness of some information sources, h) attitude about the "importance of making the right decision" and the "importance of store reputation." Hence, considerable evidence is present which illustrates that consumers' sequential search strategies are related to other variables that were not used to cluster the test subjects. These significant relationships help to provide meaningful explanations for consumer sequential search strategies.

Research Question 2a/Hypothesis One

The first hypothesis in this study can be stated as follows: "Information from information sources that are perceived as being the least costly (in terms of effort) will be acquired first during the consumer's external search." The term "least costly" was operationalized by asking respondents to rate each of the eight information sources on a 7-point scale, which ranged from "Very Easy to Locate" (1) to "Very Difficult to Locate" (7). Each person's least costly source was derived by finding the source(s) with the lowest rating (i.e., closest to 1--Very Easy to Locate). A comparison was then made between each subject's first-used source and the source ranked least

costly. If the two matched, then the subject was considered to have used the least costly source first. If the two did not match, then the person was not considered to have used the least costly source first.

In order to test this hypothesis, the frequencies of the two categories should be compared. The primary sample (n=201) had 124 subjects who rated their first-used source as "easiest to locate" in terms of effort. If subjects were expected to be equally likely to fall into either of the two categories, then the chi-square statistic of 10.99 is significant at the .001 level (one-tail test).

Sixteen out of twenty-five subjects in the validation sample rated their first-used source as "easiest to locate" in terms of effort, resulting in a chi-square of 6.76 with a .009 significance level. This data is summarized in Table 18.

Discussion of Hypothesis One

It appears that there is a relatively strong relationship between ease of locating an information source and whether it is used first in the search sequence. Based on the results of the data analysis from the two samples in this study, the hypothesis is supported.

It would seem that consumers make decisions about which information source to use first based, at least partially, on the ease of effort in locating that source. Sources that were rated the easiest to use were used first by over 60 percent of the subjects in the study. However, it is

Table 18

Test of Hypothesis One - Easy to Locate Sources are UsedFirst

		Primary Sample (n=201)	Validation Sample (n=25)
First-Used Source Rated "Easiest to Locate"	Yes	124	16
	No	77	9
		D.F. = 1 Chi-square = 10.99 p < .001	D.F. = 1 Chi-square = 6.76 p < .009

important to look at the results of the next hypothesis tested in order to determine whether there are other factors that may explain the choice of the first information source during the prepurchase information search for a durable good.

Research Question 2b/Hypothesis Two

The second hypothesis can be stated as follows: "Information sources that are perceived as being the most useful will be accessed first during the prepurchase external search for durable goods." The term "useful" was operationalized on a 7-point scale ranging from "Very Useful Information Source" (1) to "Very Useless Information Source" (7). Each person's most useful source was derived by finding the source with the lowest point score, which was equivalent to the most useful information source. A comparison was then made between each subject's most useful source and his/her source used first. If the two matched, then the subject was considered to have used the most useful source first. If the two did not match, then the subject was placed into another category of people who did not use the source they evaluated as being most useful first in their search sequences.

In order to test this hypothesis, the chi-square statistic was calculated. Subjects were asked to rate the usefulness of each information source both before and after the computer-simulated purchasing task. On the pre-simulation questionnaire, 133 out of 201 subjects rated

their first-used source as being most useful. The chi-square statistic of 21.02 was significant at greater than the .001 level (one tail test). On the post-simulation questionnaire, 144 out of 201 subjects rated their first-used source as being most useful. The chi-square statistic of 37.66 was significant at greater than the .001 level.

Nineteen out of 25 subjects in the validation sample rated their first-used source as most useful on the pre-simulation questionnaire, while 16 out of 25 rated their first-used source as most useful on the post-simulation questionnaire. These results yielded chi-square statistics of 6.76 and 1.96, respectively. The second chi-square statistic was not significant at even the .10 level. These results are summarized in Table 19.

Discussion of Hypothesis Two

The significant chi-squares on both the pre- and post-simulation questionnaires for the primary sample support the hypothesis that consumers are more likely to use the most-useful source as their first source in their prepurchase searches. The consistency from pre- to post-simulation for this group lends credence to the notion that the choice of the first information source is not a random event, and that this choice may be strongly associated with the consumer's perception of the usefulness of the information source. The results from the validation sample are mixed and, therefore, do not entirely support this hypothesis.

Table 19

Test of Hypothesis Two - More Useful Sources are Used First

		Primary Sample (n=201)		Validation Sample (n=25)	
		Pre	Post	Pre	Post
First-Used Source Rated "Most Useful"	Yes	133	144	19	16
	No	68	57	6	9
Chi-square =		D.F.=1 21.02	D.F.=1 37.66	D.F.=1 6.76	D.F.=1 1.96
Significance =	p	<.001	<.001	<.009	<.10

It would seem that consumers make decisions about which source to use first based, at least in part, upon the perceived usefulness of the information source. Averaging the primary sample's pre- and post-task survey results, over 68% of the sample used the information source which was rated as being "most useful" first in their search sequences. Seventy percent of the validation sample did so. Comparing these results with the results of Hypothesis One, it appears that the perceived usefulness of an information source shows a stronger relationship with choice of the first source than does ease of locating an information source.

Research Question 3/Hypothesis Three

The third hypothesis was developed to determine whether seller-provided information sources would be used in greater proportions than they occur in the information environment during prepurchase external search for durable goods. This hypothesis will be tested by comparing the expected frequency of seller-provided information sources with the observed frequency of usage of seller-provided information. The expected usage is based on the fact that 75% of the information sources are seller provided, and 12-1/2% are neutral (Consumer Reports) and another 12-1/2% are personal sources (friend or relative). This hypothesis was tested using both the primary sample of 201 respondents and the validation sample of 25 subjects.

Table 20 presents the results of this hypothesis for the two samples. Based on the way source usage was measured, the results do not appear to support the hypothesis. While the results of the data from the primary sample are significant at the .05 level, they are not significant in the hypothesized direction. It was hypothesized that subjects would use seller-provided sources in proportions greater than they occur in the shopping environment. However, the results of the study indicate that the subjects actually used the seller-provided sources in proportions lower than they occur in the shopping environment.

Discussion of Hypothesis Three

Because seller-provided information sources are so numerous and so easily accessed, it was hypothesized that subjects would use them in greater proportions than they occur in the shopping environment. This hypothesis cannot be accepted. Not only did the subjects not utilize the seller-provided information sources in proportions greater than they exist in the environment, but their usage was in the opposite direction. It appears that usage of the three types of information sources was fairly stable and approximately the same in both samples. This provides some support for the reliability of the measure.

These results may have come about due to the manner in which the source usage was measured. Each time a subject used one of the eight different sources, the source was

Table 20

Test of Hypothesis Three - Seller-Provided Sources Not Used
in Greater Numbers than Expected

Source Type	Observed Frequency of use	Expected Frequency of Use
Primary Sample: ^a (n=201)		
Seller Provided	298	313.50
Personal	50	52.25
Neutral	70	52.25
Validation Sample: ^b (n=25)		
Seller Provided	32	33.75
Personal	6	5.63
Neutral	7	5.63

^adegrees of freedom = 2; chi-square = 6.893; $p < .032$.

^bdegrees of freedom = 2; chi-square = 7.452; $p < .798$.

counted. However, if the subject used the "store visit" source and visited more than one store, it was still counted as only one source. Therefore, no differentiation was made in the counting procedure between the light usage of a source and the heavier usage of a source. Respondents had the opportunity to access up to: eight stores in person or by telephone, three magazines, nine friends and/or relatives, four consumer catalogs, and three Yellow Pages listings. As one can see, all of these except the friends and/or relatives source are seller-provided sources. If each store visited or each catalog perused, for example, had been counted individually as a source, then the outcome might have been different.

As it stands, the data suggest that consumers use the different seller-provided information sources in proportions that are slightly lower than this type of source occurs in the shopping environment. The personal source of information was utilized in approximately the same proportions as it occurred in the environment, while the neutral source of information was accessed in slightly higher proportions than it existed in the environment. The neutral source may have been used more frequently in this study than it is normally used due to the way the shopping environment was set up in this study. It can, of course, be concluded that seller-provided information sources as a category are accessed far more frequently than other sources

of information are accessed. The frequency figures in Table 20 bear this out.

Research Question Four/Hypothesis Four

Hypothesis Number Four can be stated as follows: "The presence of a neutral source in a consumer's search sequence will be associated with a longer, more extensive search." In this study there was only one neutral source--Consumer Reports magazine (knowledgeable friends and relatives were considered to be personal sources). This hypothesis can be tested by dividing the sample into two groups with group membership determined by whether the Consumer Reports information source was used during the search sequence.

The Mann-Whitney U test can then be used to determine whether the two groups came from the same population or from different populations. This is the powerful nonparametric alternative to the t test, and it is being used because assumptions cannot be made about the populations' distributions and variances (Siegel, 1956). The hypothesis predicts that the source usage of the Consumer Reports user group is stochastically larger than the source usage of the non-Consumer Reports users (i.e., a one-tailed test).

The results of the Mann-Whitney U test are reported in Table 21. The extreme value of U (1307) indicates that there is a nonrandom distribution of scores and that the source usage exhibited by the two groups follows different patterns.

Table 21

Mann Whitney U Test of Hypothesis Four

Groups	Number of Cases	Mean Rank
<u>Consumer Reports</u> Users	70	147.83
<u>Consumer Reports</u> Non-users	131	75.98

U = 1307.0

Z (corrected for ties) = -8.8689

P < .0001

The Z statistic of -8.8689, which is corrected for ties, is significant at the .0001 level. This is supportive of the hypothesis that Consumer Reports users exhibit longer, more extensive searches than non-users.

Discussion of Hypothesis Four

It was hypothesized that subjects who used Consumer Reports magazine during their prepurchase search sequences would exhibit longer, more extensive searches. Consumers who read Consumer Reports-like magazines have been found to be information sensitive, that is, they tend to gather a great deal of information about products/services and marketplace offerings and seem to be receptive to more diverse types of information sources. Since the Mann-Whitney U test resulted in an extremely large U value and a highly significant Z statistic, strong evidence is provided for the hypothesis that Consumer Reports users perform longer, more extensive prepurchase information searches. More specifically, the Consumer Reports readers made use of more different types of information sources than non-users of Consumer Reports.

The fact that Consumer Reports magazine users accessed approximately two times as many different information sources as non-users (3.1 sources versus 1.5 sources) is certainly illustrative of the amount of difference between the search processes of the two groups. However, when one realizes that almost everyone utilizes the "personal visit to store" source, the mean implies that Consumer Reports

users probably also make use of the "personal visit to store" source, and perhaps some of them make use of one additional source. When examined in this light, the difference does not seem so spectacular.

Questions of Validity

It is important to purposefully design the research so that the question of validity can be addressed. First, questionnaire items were designed to measure subjects' perceptions of the realism of the computer task and the information provided within the computerized setting. Second, a comparison was made between the data generated by the primary sample and the validation sample. It was intended as a method of determining whether there was convergent validity between two methods of measurement.

Subjects' Perceptions of Computer Task

The subjects were asked to rate several items in order to obtain several measures of their perceptions of the simulated purchasing exercise. The researcher wanted to determine if the subjects thought that the exercise was realistic or whether the exercise changed the way they would normally approach this type of purchasing situation. Ten attitudinal items were included at the end of the computer task, each with responses on a seven-point scale ranging from Strongly Agree (1) to Strongly Disagree (7).

Subjects were presented with the following items for rating: With respect to the computer shopping exercise,

1. I acquired MORE information than I normally would because I was curious about, or intrigued with, the computer.
2. I acquired MORE information than I normally would because it was easy to access on the computer.
3. I acquired LESS information than I normally would because I felt inhibited or nervous about using the computer.
4. I acquired LESS information than I normally would because of the time delays (time costs) built into the computer program.
5. I acquired purchase information DIFFERENTLY than I normally would because the actual product could not be examined personally by me.
6. I acquired purchase information DIFFERENTLY than I normally would because my favorite store was not included in the study.
7. I acquired purchase information DIFFERENTLY than I normally would because my favorite brand was not included in the study.
8. I acquired purchase information DIFFERENTLY than I normally would because my major source of information regarding this product type was not included in this study.
9. I acquired and used purchase information as I NORMALLY would in an actual purchase situation for this type of product.

10. How REALISTIC do you feel this study was in presenting the types of sources and information available in the marketplace for the color television product class?

(Very Realistic [1] to Not Very Realistic at all [7])

The overall mean response as well as the mean ranks and means for each cluster on each of the ten items are presented in Table 22.

The subjects' reactions to the simulated purchasing task on computer generally indicated that the subjects believed that the computer simulation was a good representation of how they would have actually approached such a purchase decision. Questions 1 and 2 indicate that the subjects did NOT think that they acquired more information than they normally would during the prepurchase search process because of the ease of accessing information or their curiosity/intrigue with the computer. The lower mean scores on Question 2 suggest that it is more likely that subjects will acquire more information than they normally would due to the ease of acquiring information from the computer than to curiosity/intrigue with the computer.

Subjects also indicated that they did NOT think that they acquired less information than they normally would due to either the time delays programmed into the computer or to their nervousness or computer inhibitions. It appears that one of the biggest sources of artificiality in this study

Table 22

Perceptions of Subjects Regarding the Computer SimulationPurchasing Task

Question Number	Overall Mean (Std.Dev.)	Cluster 1 Mean	Cluster 2 Mean	Cluster 3 Mean	Cluster 4 Mean	Cluster 5 Mean	ANOVA Significance
1	4.92 (2.18)	5.44 (1.92)	4.26 (2.30)	6.11 (1.64)	4.45 (1.98)	5.41 (2.24)	.001
2	4.40 (2.28)	5.13 (1.88)	3.67 (2.39)	5.06 (2.15)	4.03 (2.12)	4.93 (2.43)	.002
3	6.21 (1.65)	6.48 (1.29)	5.82 (2.04)	6.56 (1.15)	5.87 (1.82)	6.89 (0.32)	.015
4	6.16 (1.43)	6.33 (1.06)	5.92 (1.77)	6.22 (1.22)	6.13 (1.12)	6.48 (1.48)	n.s.
5	3.59 (2.18)	3.94 (2.23)	2.86 (2.02)	4.28 (2.32)	3.58 (1.93)	4.44 (2.21)	.003
6	5.16 (2.33)	5.17 (2.35)	4.99 (2.49)	5.83 (1.79)	5.16 (2.37)	5.19 (2.20)	n.s.
7	6.15 (1.69)	6.17 (1.58)	6.30 (1.57)	5.94 (1.98)	6.13 (1.67)	5.89 (2.06)	n.s.
8	5.97 (1.78)	6.33 (1.52)	5.67 (1.94)	6.00 (1.85)	5.52 (1.98)	6.59 (1.22)	.049
9	2.39 (1.72)	2.33 (1.69)	2.27 (1.73)	2.89 (2.14)	2.39 (1.43)	2.48 (1.83)	n.s.
10	2.20 (1.43)	2.35 (1.37)	1.96 (1.44)	2.11 (1.02)	2.81 (1.64)	1.93 (1.33)	n.s.

Note. n.s. means not significant at .05 level.

was the inability of the respondents to examine the product in person (color television) before buying. The responses of all the clusters indicate that they agreed mildly with the statement about acquiring purchase information differently than they normally would because they could not examine the product personally. Subjects were given the opportunity to look at photographs of the various television brands, however, they could not judge the quality of the picture from these photographs. Hence, they must have realized that they had to obtain information somewhat differently to compensate for this.

Subjects generally disagreed that they acquired information differently because their favorite store or brand was not included in the study. The disagreement was less extreme for the favorite store item than for the favorite brand item. This may have been due to the fact that all the stores in the market area were not included in the study. In particular, one store which held a substantial part of the market had burned down and was closed when the computer simulation was being designed and programmed. However, when the study was being conducted this store had reopened in a new location with an even larger inventory.

Subjects agreed with the statement that they acquired and used purchase information as they normally would in this type of purchase situation. Since the subjects' agreement with this statement was only moderate, the data suggest that

the subjects perceived a difference between acquiring and using information in a natural setting and in a laboratory simulation. This difference between reality and the laboratory is, of course, understandable.

Finally, the subjects rated the computer purchase simulation as being quite realistic in presenting the types of sources and information available in the marketplace for the product category being investigated. On a 7-point scale, with 1 being Very Realistic, the mean response by the sample was 2.2 on this item. In addition, the range of means for the five clusters was not that wide indicating that the test subjects generally perceived the purchase simulation task to be a relatively realistic portrayal of the actual situation.

The subjects in this study generally did NOT believe: (a) that they acquired more or less information than they normally would have, or (b) that they acquired information differently than they normally would have. They tended to believe that the computer task realistically portrayed the decision process and that they acquired and used information as they normally would have. The sample's responses to these questions provide some support for the validity of the computer interactive simulation of consumer decision making.

The Validation Sample

In order to obtain additional information regarding the validity of the computer interactive data collection methodology, a second sample of people was used in this

study. This second sample of people was chosen because they had recently purchased a color television from one of the eight stores that were included in the study. Two measurements would be taken from these subjects, one involving a personal interview and the other involving the computer data collection methodology.

There are several ways to examine the similarity between the two measurements for each subject in this sample. Generally speaking, most subjects recalled using more information sources in the personal interview than they did when they recreated their purchasing process during the computer simulation. The mean number of sources used according to the computer simulations was 1.8 sources versus 3.0 for the personal interviews. This depth-of-search measure suggests that the two methods are certainly not consistent if one method of measuring consistently results in more data being collected. It is very possible that learning effect could have been operating, and this could account for less search during the computer-simulated task. These subjects had all been through an actual purchasing process; therefore, during the recreation of their prepurchase searches some may not have "needed" to use as many sources because they already possessed more information than the average consumer.

Another way to look at whether the two methods are consistent is to compare both of the subject's search sequences to see if there is agreement. When comparing the

total search sequences of each subject, only 12% (3 out of 25) had exactly the same search sequences on the two measurements. Given that the personal interviews resulted in longer search sequences than the computer simulations, it would be expected that few search sequences resulting from personal interviews would be fully included in the subjects' search sequences resulting from the computer simulations. This was borne out by the results; again, only 12% of the sequences resulting from personal interviews were fully included in the computer simulation search sequences.

On the other hand, 76% (16 out of 25) of the subjects' computer simulation search sequences were included in the sequences that were elicited through the personal interview. This indicates that there is some consistency between the two measures, and that the computer simulation seems to result in shorter searches.

Were the differences between the two methods of measurement due more to the use of different information sources or to the use of the same sources in different sequence? In examining the two sequences for each individual, it was found that only 12% of the subjects used all of the same sources in both measurements, regardless of the sequence of their use. When examining whether each subject used at least one source in both of the measurements, it was found that 92% of the subjects did indeed use at least one source in both of their sequences. What is somewhat puzzling is the 8% (2 subjects) who

exhibited no correspondence whatsoever between their two search sequences. This is most likely due to a lack of understanding of the task they were asked to perform.

The evidence provided by the second, smaller sample seems to suggest that the computer simulation results in a shorter search sequence than the personal interview. Evidence is also provided that indicates two occurrences. The first is that the computer simulation results in subjects using fewer sources than they verbalize in the personal interview. The second is that subjects may have used some of same sources in both measurement procedures, but not necessarily in the same order. Hence, the two measurement methodologies differ on both content of search as well as sequence.

Another Comparison

The data obtained from the small validation sample can also be compared to the results of the large, primary sample. More specifically, the transition matrices can be compared to determine if the same transitions from source to source were exhibited by subjects in the two samples. Table 23 shows how the two transition matrices compare in terms of entries in each cell.

The two transition matrices can be compared in several ways. First, the entire matrices can be compared to determine the overall agreement of the matrices. Each cell can be examined to determine if: (a) both matrices have a non-zero value in them or (b) both matrices have a zero

Table 23

Comparison of Transition Matrices Between Primary and Validation Samples

(First row represents primary sample; second row represents validation sample)

FROM: Source Number	TO: Source Number:							
	1	2	3	4	5	6	7	8
1 ^a	0.0% 0.0%	0.0% 0.0%	0.0% 0.0%	1.3% 5.0%	0.0% 0.0%	0.4% 0.0%	0.0% 0.0%	0.0% 0.0%
2	0.9% 0.0%	0.0% 0.0%	0.4% 0.0%	7.2% 5.0%	3.8% 0.0%	1.7% 5.0%	3.0% 5.0%	0.0% 0.0%
3	0.0% 0.0%	0.4% 0.0%	0.0% 0.0%	1.7% 0.0%	0.4% 0.0%	0.0% 0.0%	0.4% 0.0%	0.4% 0.0%
4	0.4% 0.0%	1.7% 5.0%	0.4% 0.0%	0.0% 0.0%	3.0% 0.0%	5.5% 5.0%	3.8% 0.0%	1.7% 0.0%
5	0.4% 0.0%	2.6% 5.0%	0.4% 0.0%	8.5% 20.0%	0.0% 0.0%	3.8% 5.0%	1.7% 5.0%	0.9% 0.0%
6	0.4% 5.0%	0.9% 0.0%	0.4% 0.0%	7.7% 0.0%	1.3% 0.0%	0.0% 0.0%	2.6% 0.0%	0.9% 0.0%
7	0.0% 0.0%	9.4% 0.0%	1.3% 0.0%	7.7% 10.0%	1.3% 5.0%	4.3% 5.0%	0.0% 0.0%	1.7% 5.0%
8	0.0% 0.0%	0.0% 0.0%	0.0% 0.0%	2.1% 5.0%	0.0% 0.0%	0.9% 0.0%	0.4% 0.0%	0.0% 0.0%

Note. Number of subjects in primary sample (n=201) using at least two sources = 111; number of transitions in primary sample = 235; number of subjects in validation sample (n=25) using at least two sources = 12; number of transitions in validation sample = 20; percentages are based on the number of transitions in each sample.

^aNumbers in columns and rows represent the eight information sources: 1=magazines; 2=catalogs; 3=Yellow Pages; 4=store visits; 5=newspaper ads; 6=knowledgeable friend or relative; 7=Consumer Reports magazine; and 8=telephone call to retail store.

value in them. If (a) or (b) above is found to exist, then there is agreement between the matrices. Over the entire matrix, there was 57.8% agreement between the two transition matrices based on the rules stated above. Considering that the values on the diagonal in the matrices are all expected to be zero, however, the agreement rate would be reduced to 51.0%.

The matrices can also be compared by row. The highest degree of correspondence between the two matrices was on the following rows: 1 (7 out of 8 items agreed); 2 (5/8); 5 (5/8); 7 (6/8); and 8 (6/8). Little agreement was found on the third (3/8), fourth (3/8), and sixth rows (2/8) between the matrices.

It should be mentioned that the small size of the validation sample is probably a major source of disagreement between the two matrices. There was not a sufficient number of transitions in the small sample to fill a proportionate number of cells, compared to the larger sample. However, it is encouraging to find this amount of consistency between the two samples, particularly when one of the samples is so small.

It appears that the major differences between the matrices of the two samples involves the use of the personal visit to the store, the use of the Yellow Pages, and the use of a knowledgeable friend or relative. The validation sample seemed to use all three of these sources to a lesser degree than the subjects in the primary sample. More

specifically, these three sources were underutilized as the first source in a two-source transition. For example, the subjects in the validation sample did not seem to make personal visits to retail stores prior to using other sources, but they did make visits to retail stores after using other sources. The use of the knowledgeable friend or relative source was more likely to be used by the members of the validation sample after using another source rather than before. No one in the validation sample used the Yellow Pages source at all.

Why would the people who recently purchased a color television utilize different information sources? Perhaps the answer lies in the situation into which the members of the primary sample were placed. They were instructed to shop as they normally would and to make a purchase decision. However, they had to "check out" the make-believe environment first to discover what kind of information was available to them. For this reason, I believe, the primary sample used a mean of 2.0 sources while the validation sample used a mean of 1.8 sources. The members of the validation sample had actually purchased a color television, and they were instructed to recreate their prepurchase shopping process in the computer simulation. They were not actually going through a novel decision-making process; rather, they were looking for sources that they had actually used. Hence, they did not need to become acquainted with a

new shopping environment as the members of the primary sample probably did.

The differences between the two measures of the validation sample members and between the primary and validation samples' responses to the simulated purchasing task provide reason to be concerned with the validity of this laboratory computer methodology. The simulated purchasing task may result in the over- or under-acquisition of information or in the over- or under-utilization of certain types of information sources. On the other hand, it is difficult to say which of the measures of the consumer decision-making process is the most accurate. The personal interviews with recent television buyers may be inaccurate due to loss of memory or confusion, and the simulated purchasing exercise may actually be a better representation of the information-seeking and decision-making processes. Only the conduct of more studies will help to determine whether laboratory simulations using the computer result in valid measurements.

Summarization of Validity Checks

With regard to the subjects' perception of the realism of the computer simulation of a prepurchase information seeking and decision-making task, it appears that subjects perceived the task to be somewhat realistic and isomorphic to reality. On the other hand, the degree of agreement between the computer interactive data collection methodology and the personal interview technique was minimal. Hence,

the data collection methodologies can be questioned or the fact that the subjects who had been personally interviewed tried to recreate their prepurchase information seeking on the computer may be at fault.

Summary of Research Results

The results of this research project provide some new insights into prepurchase information search for durable goods. The major research question inquired as to whether there were a small number of distinctly different search strategies. With the aid of process data and cluster analysis, five distinct search strategies were detected and profiled. The five search clusters included: 1) variety information seekers, 2) one-source shoppers, 3) information intensive shoppers, 4) advice seekers, and 5) seller-provided information seekers.

Two corollaries to the main research question were also posed. Research Question 1a inquired about differing probabilities of source sequences. A transition matrix of all two-source search sequences indicated differing frequencies. Further, complete search paths were shown to be associated with specific search strategy clusters. Research Question 1b inquired about the meaningfulness of the clusters with respect to whether cluster membership was associated with other characteristics of the consumer. Several individual characteristics were found to be related to cluster membership.

The first hypothesis investigated whether the choice of first information source was related to perception about the ease of locating the source in terms of effort. The relationship was found to be significant. The second hypothesis investigated whether the choice of first information source was related to perceptions regarding the usefulness of the source. This relationship was also found to be significant. Since both ease of locating a source and perceived usefulness of a source are significantly related to first source used, it appears that the consumer chooses on the basis of perceived costs versus perceived benefits. More subjects did, however, use the source perceived to be most useful first than the source perceived to be easiest to locate.

The third hypothesis predicted that seller-provided information sources would be used in greater proportions than they occur in the marketplace environment. No support was found for this hypothesis although seller provided sources were used with the greatest frequency.

The fourth hypothesis predicted that consumers who used the neutral Consumer Reports magazine would exhibit longer, more extensive searches than consumers who did not use this source. The data supported this hypothesis.

Finally, the research methodology was subjected to procedures to assess its validity. Subjects generally rated their computer-interactive simulated searches as being realistic and similar to what they would normally do during

prepurchase search. However, the comparison of the computer-simulated search with the ex post facto reports of the members of the validation sample revealed little consistency between the two methods. This suggests that the computer simulation may require some improvements to make it more similar to the actual search situation.

CHAPTER VI

SUMMARY OF RESULTS, IMPLICATIONS, LIMITATIONS AND
SUGGESTIONS FOR FUTURE RESEARCH

Summary of Research Results

The study of the process of prepurchase information seeking for a durable good was the focus of this research. This study was carried out using a relatively new data collection methodology, which allowed the subject to interact with a microcomputer. The subject was asked to perform a computer-simulated information-seeking and purchasing task, and the computer tracked the entire information-seeking process. The subject was given the options of either making a purchase decision or deciding not to purchase after information seeking. The previous chapters have summarized the research that has been done on the topic of information search for durable goods. The topic of external search prior to the purchase of a durable good was discussed as it related to five of the major models in the consumer behavior field.

The review of the literature pointed out the fact that one dimension of information search has not been studied, and that is the SEQUENCE dimension of information search. The direction, degree, and patterns of external search have been studied by marketing researchers, but the actual order/sequence in which consumers conduct their external searches has not been reported on in the literature. Various research methodologies were considered to accomplish the

aims of this study, but the computer-simulated approach appeared to be the most appropriate and promising for measuring a behavioral process in a laboratory setting.

Hence, the computer-simulated information-search and purchasing task was utilized to collect data from two hundred one subjects in the primary sample and twenty-five subjects in a validation sample. The primary sample subjects were chosen using probability sampling techniques, while the validation sample subjects were obtained through purposive sampling. The subjects were compensated for their participation in this study.

All of the data that was collected from the members of the primary sample was saved and stored on computer disk. However, this process data could not be analyzed until it was transformed into fixed format data. Data transformations were conducted on the process data according to the rules set down in the operational definitions. The data were then analyzed according to the proposed research outline. Below is a summary of the hypotheses that were posed and tested in this research study.

Research Question One

Research Question One asks: "Will consumers exhibit a limited number (less than 10) of distinctly different sequential patterns of information source usage (external search) prior to purchase decision making for durable goods?" The cluster analysis statistical technique was used to determine whether distinct sequential patterns of

information source usage could be found in the data. Specifically, a hierarchical cluster analysis algorithm was utilized because it has been suggested that this is most appropriate when one is attempting to build a taxonomy. Ward's hierarchical cluster method was chosen because it is an effective method to use when all the cases must be classified and when there are noise points between the cluster boundaries.

The variables used in the cluster analysis procedure for clustering the cases were: (a) the source used first, (b) the presence/absence of ten frequently-exhibited transitions between two information sources, and (c) the number of different information sources used in the prepurchase search. Through a variety of methods for determining the most appropriate number of clusters, it was concluded that a five cluster solution was optimal for this study. Given the atheoretic nature of cluster analysis algorithms, it is important to investigate whether the resulting clusters are stable and whether the clustering algorithm chosen is reliable. The results of the Ward's hierarchical clustering method were compared with several other methods' results; the results of the Ward's method were found to be in considerable agreement with several alternate clustering methods. The cross-validation method with a hold-out sample was also used to assess the assignments which resulted from the cluster analysis. The

results of this analysis suggested that the clustering assignments are very reliable.

The five resulting clusters were labelled, using the general search characteristics of each group. The general search behaviors of each group will be summarized next.

The five search strategies include: Variety Information Seekers, One-Source Shoppers, Information Intensive Shoppers, Advice Seekers, and Seller-Provided Information Seekers. The Variety Information Seekers all used more than one source of information; most began their searches by using either Consumer Reports magazine or by making a personal visit to a retail store; and the members of this cluster made extensive use of four information sources--store visits, newspaper advertising, friends and relatives, and Consumer Reports magazine. Members of this cluster were averse to using catalogs as an information source. However, they were twice as likely to use Consumer Reports magazine before making a visit to a retail store than after a store visit. They are somewhat more likely to consult with friends and relatives after they visit a retail store than before, but both sequences are likely to occur. They are also likely to check with a friend or relative after reading newspaper advertising or Consumer Reports magazine. This group was labelled "Variety Information Seekers" because they tended to utilize commercial, personal, and neutral sources of information during their external searches. They represented twenty-six percent of

the sample. The One-Source Shoppers all used only one information source before making the purchase decision. Most of the members of this group visited one or more retail stores and then made their purchase decisions. A smaller percentage made their purchase decisions based on newspaper advertising or Consumer Reports magazine information. This was the largest cluster, with thirty-six percent of the sample using this type of purchasing strategy.

The Information Intensive Shoppers exhibited the greatest amount of information seeking, but represent only about nine percent of the sample. Almost all of this group began their external searches by using Consumer Reports and then went on to use the whole range of information sources including catalogs, newspaper advertising, and friends and relatives. All of the consumers in this cluster made use of Consumer Reports magazine and subsequently used the catalog source. The catalog source is likely to be followed by either a personal visit to a retail store or the use of newspaper advertising. The newspaper advertising source is most likely to be followed by consulting with a knowledgeable friend or relative. This group got its name for the way they went about their information seeking--they seemed to seek out more information than most consumers and "did their homework" before going to a retail store.

The Advice Seekers search strategy cluster represented slightly more than fifteen percent of the sample. The majority of this group used a knowledgeable friend or

relative as their first source, while slightly more than twenty-five percent used the catalog as their first source. More than fifty percent of this cluster made a purchase decision after utilizing only one information source. The members of this cluster who used more than one information source are most likely to either consult with a knowledgeable friend or relative and then visit a retail store OR visit a retail store and then consult with a knowledgeable friend or relative. Consumer Reports is another source utilized by some members of this group for obtaining advice prior to purchasing. Generally, the advice sought by this group is either neutral or personal in nature.

The final group of consumers resulting from the cluster analysis was called Seller-Provided Information Seekers due to the nature of information they sought. Newspaper advertising was the most likely first source used by this group, and catalogs were the second most likely source used first. A popular search sequence exhibited by members of this cluster is the use of newspaper advertising followed by a retail store visit. Another popular search sequence involves the use of catalogs followed by either a retail store visit or the use of newspaper advertising. The members of this cluster, who comprise approximately 13.5% of the sample, relied primarily on commercial, seller-provided information. More specifically, much of the information they sought was printed matter. The evidence presented

supports the hypothesis that there is a small number of distinctly different sequential patterns of information search for a durable good. The analysis suggests that the clustering method is reliable and that the clusters are relatively stable. The search profiles of each cluster seem to be logical, reasonable, and distinctive.

Research Question 1a

Research Question 1a was stated as follows: "Given the use of an information source in the prepurchase external search sequence, will other sources possess varying probabilities of occurring next in the sequence?" Stated as a null hypothesis this would read: "Each of the information sources has an equal chance of occurring at each step of the prepurchase search sequence." A transition matrix was constructed so that all two-source search sequences could be recorded. The chi-square statistic could not be calculated because the frequencies of such a large proportion of the cells were less than five. This problem was due to the relatively small sample size and the corresponding small number of transitions that were exhibited by the sample. There were not enough transitions in total to allow each cell to have a frequency of five, and the null hypothesis stated that all transitions would have an equal chance of occurring (i.e., equal cell frequency). However, some two-source transitions had relatively high frequencies, indicating a small number of common search sequences.

The top five most frequently used sources in order are: (1) personal visit to a retail store, (2) Consumer Reports magazine, (3) catalogs, (4) knowledgeable friend or relative, and (5) newspaper advertising. The sources that were found to be used as the first source most frequently were: (1) a personal visit to a retail store, (2) Consumer Reports magazine, (3) newspaper advertising, (4) catalogs, and (5) a knowledgeable friend or relative. Whereas the personal visit to a retail store was by far the most frequently used last source before a purchase decision is made, knowledgeable friends or relatives were also used as a last source by ten percent of the sample.

There were ten transitions that each comprised at least 3.5% of the 235 two-source transitions. There were fifty-six possible two-source transitions, and the ten transition types accounted for over 61% of all of the two-source transitions.

The ten most common information search transitions were:

- (1) catalogs to personal visit to retail store
- (2) catalogs to newspaper advertising
- (3) personal visit to retail store to knowledgeable friend or relative
- (4) personal visit to retail store to Consumer Reports magazine
- (5) newspaper advertising to personal visit to retail store

- (6) newspaper advertising to knowledgeable friend or relative
- (7) knowledgeable friend or relative to personal visit to retail store
- (8) Consumer Reports magazine to catalogs
- (9) Consumer Reports magazine to personal visit to retail store
- (10) Consumer Reports magazine to knowledgeable friend or relative.

Search paths were also diagrammed in tree-like fashion, and their probabilities of occurring were calculated. These search paths, which depicted entire search sequences rather than sequences of only two sources, clearly show the disproportionate use of the eight information sources.

Given all of the above evidence, Research Question 1a results in the tentative answer that some sources are indeed likely to be followed by the use of other specific sources. It appears that prepurchase information search is not random, that prepurchase information search is purposive, and that there are certain sequences of source usage that appear to be followed in greater proportion than they would be expected to by chance.

Research Question 1b

Research Question 1b states: "Is the use of different sequential patterns of external search for a durable good related to one or more demographic, socioeconomic, and/or psychological variable(s)?" When data are entered into a

cluster analysis computer program, the program will result in the clustering of the cases. However, this does not mean that the clusters are meaningful, logical or comprehensible. In order to further validate the clustering assignments, it was important to cross-tabulate cluster membership with other data collected in the study to see if particular search strategies are associated with other characteristics of the consumer. Nonparametric statistics were used for determining whether the relationships were significant.

First, other search variables that were not used for clustering purposes were cross-tabulated with cluster membership in an effort to determine if there were any significant relationships. Almost all of the other search variables measured in this study were significantly related to cluster membership. Whereas the search variables used for clustering purposes were primarily related to sequence of search, the variables that were cross-tabulated with cluster membership were primarily content-of-search and depth-of-search variables. By looking at the chi-square significance level combined with Lambda and the Uncertainty Coefficient, it was determined that three variables are most closely associated with the cluster assignments; they are the number of different information sources used, whether Consumer Reports magazine was used, and whether the catalog source was used. Neither the store where the television was purchased nor the brand purchased were significantly related to cluster membership.

Members of the Variety Information Seeker cluster seemed to: use a greater than median number of information sources, exhibited a greater depth of search, and asked more than the median number of questions at retail stores. They also tended to visit more stores, consult more friends and relatives, ask more questions of friends and relatives, and ask more questions over the telephone than the other clusters.

Members of the One-Source Shopper cluster appeared to be below the median on all information-seeking behavior. Members of the Information Intensive Shopper cluster used more than the median number of catalogs and information sources, and they exhibited a greater than median depth of search.

Members of the Advice Seeker cluster tended to use more magazines, Yellow Pages, and friends and relatives than the majority of other consumers. They also tend to ask the most questions of friends and relatives.

Members of the Seller-Provided Information Seeker cluster used more than the median number of catalogs, exhibited a greater than median depth of search, and asked more than the median number of questions at the retail store. They also tended to visit more stores.

Hence, this analysis suggests that the five clusters that were developed from search sequence data are related to other search variables that describe the content and depth of search.

The five clusters were also cross-tabulated with a number of individual variables in an effort to provide evidence of external validity and support for Hypothesis Number Two. Chi-square analysis found significant relationships between cluster membership and age of youngest child, educational level, and type of decision process used. The median test resulted in a significant relationship between cluster membership and age, age of youngest child, and educational level. The One-Source Shoppers tended to be older than the median and had children who were older than the median. Members of the Variety Information Seeker cluster and the Information Intensive Shopper cluster tended to have achieved higher than median education levels. The Information Intensive Shoppers also tended to earn higher than median household incomes.

With respect to decision process, it appears that members of the One-Source Shopper and Advice Seeker clusters were most likely to have made up their minds before beginning their search for new information. The Variety Information Seekers and the Information Intensive Shoppers tended to search first, make a choice about what brand to buy, and then make a choice about the store from which to buy. The Seller-Provided Information Seekers were most likely to search and make a choice about brand and store simultaneously.

Attitudinal information was also obtained from the subjects in this study, and this data was cross-tabulated

with cluster membership. The results of a Kruskal-Wallis One-way analysis of variance by ranks yielded eight significant differences out of twenty-seven attitudinal items. There was a significant difference between the means of the clusters on the ease of acquiring information from: catalogs, Yellow Pages, store visits, and newspaper advertising. It appears, however, that the consumer's perception of ease of acquiring information may have little to do with whether s/he uses an information source. The Seller-Provided Information Seekers seemed to have rated magazines significantly higher than the members of the other clusters, but they did not seem to make use of this source to a greater degree. Interestingly, the two clusters exhibiting the shortest search sequence rated the "Importance of Making the Right Decision" significantly more important than the members of the other clusters. The One-Source Shoppers also rated the "Importance of Store Reputation" significantly more important than members of the other clusters. This corresponds with the fact that the only source used^a by many of the One-Source Shoppers is the retail store. When they rely so heavily on only one source, the reputation of that source is extremely important.

Given the significant relationships between cluster membership and demographic, socioeconomic, and psychological variables, it appears that one can respond to the research question positively. Some of the individual variables were related to cluster membership.

Hypothesis Number One

Hypothesis Number One stated that "Information from information sources that are perceived as being the least costly in terms of effort will be acquired first during the consumer's external search." Subjects were categorized into two groups based upon whether or not they used the source first that they rated easiest to locate. The chi-square statistic was calculated, and the significant results suggest that the subjects in this study were likely to use the source that they perceived to be easiest to locate first in their search sequences. Over sixty percent of the subjects in this study used the source they evaluated as easiest to locate first in their search sequences. Hence, it appears that ease of acquiring information is associated with its early acquisition in the search process.

Hypothesis Number Two

Hypothesis Number Two was stated as follows: "Information sources that are perceived as being the most useful will be accessed first during the prepurchase external search for durable goods." Subjects were categorized into two groups based upon whether or not they used the source first that they rated as being the most useful. The chi-square statistic was calculated, and the significant results suggest that the subjects in this study were likely to use the source that they perceived to be the most useful first in their search sequences. This particular attitude statement was given to the respondents

twice--before and after the computer-simulated purchasing task. Sixty-six percent of the subjects used the source they rated most useful first in their search sequences on the before measurement; while seventy-one percent of the subjects in the post-measurement used the source they rated most useful first in their search sequences. It appears, then, that the consumer's choice of first information source is strongly associated with his/her perception of the usefulness of that information source. In a comparison of the results of Hypotheses One and Two, the data suggest that consumers would be more likely to use a source that is perceived to be "most useful" before using a source that is perceived to be "easy to locate." The marketer would be wise, therefore, to make useful information as easy to locate and acquire as possible.

Hypothesis Number Three

Hypothesis Number Three can be stated: "Seller-provided information sources will be the most frequently used type of information source during prepurchase external search for durable goods." This hypothesis was not supported by the empirical data collected in this study. There appeared to be a slightly lower proportion of seller-provided information sources used than they occur in the shopping environment. It should be noted, however, that over 70% of the information sources used were seller-provided sources.

Hypothesis Number Four

Hypothesis Number Four was stated as follows: "The presence of a neutral source in a consumer's search sequence will be associated with a longer, more extensive search." The neutral source referred to in this hypothesis was Consumer Reports magazine. Subjects were divided into two groups on the basis of whether or not they used CONSUMER REPORTS in their information searches. The mean number of sources used by the two groups was calculated, and the difference between the two means was found to be significant and in the predicted direction. Hence, the data suggest that consumers who do use Consumer Reports magazine do seem to be receptive to more prepurchase information and do seem to utilize ~~more~~ diverse types of information sources.

That completes the summary of the outcomes of the research. We will now turn our attention to the practical implications of this research for marketing managers.

Implications For Marketing Managers

The research findings from this study suggest that consumers use different sequential search strategies for acquiring information prior to purchasing a durable good. These search strategies differ in terms of the type and number of information sources used as well as in terms of the sequence in which the sources were accessed. The data also suggest that some information sources have greater probabilities of being used before/after other sources. Different search strategies exhibited by consumers point out the importance of marketers developing and using different

marketing strategies and marketing mixes. A discussion follows on each of the five consumer sequential search strategies, and a marketing strategy/mix is suggested for reaching each segment.

One-Source Shopper Profile

The largest search strategy segment--the One-Source Shoppers--comprised 36% of the main sample. Eighty-four percent of this segment used only the "personal visit to retail store" source, with the average number of stores visited being slightly more than two. Eight percent of this segment made a purchase decision after reading newspaper advertisements, while another eight percent made their decision after reading Consumer Reports magazine. An analysis of this group indicates that they conduct the least thorough searches and make the quickest purchase decisions. Slightly more than 5% of this segment decided not to make a purchase decision after searching. This may indicate that some subjects were confused about the purchasing task or that they really did not wish to make a purchase decision.

Compared with the other segments, the members of this segment rated "the importance of making the right purchase decision" and "the importance of store reputation" the highest (i.e., more important). In other words, it is very important to members of this group that they make good purchase decisions, but it appears that they depend on the reputation and expertise of the retailer to help them do that. This is supported by the fact that 41% of this

segment "bought" a color television from a specialty television/furniture store. About thirty percent of this segment "purchased" from Sears and Montgomery Wards, while about 25% of this segment "bought" from K Mart or Zayres (discount stores). Hence, a large proportion of this segment buy from the type of store where they can get good advice, information, and after-sales service. Compared with the other segments, members of this segment rated the retail store visit as being relatively easy to acquire information from. Members of the One-Source Shopper group also rated newspaper advertising as being an easy source from which to acquire information. Generally speaking, members of this segment are older; have older, but fewer children; have attained a lower level of education; possess less purchasing experience; and have lower household incomes. As a group, they indicated they were most likely to have made up their minds before searching for new information.

Marketing Strategy for Appealing to One-Source Shoppers. This search strategy indicates that the marketer desiring to reach the largest segment would choose to attract members of the One-Source Shopper segment by using the following marketing strategy. First, the retailer should possess credibility as a store that specializes in the particular product category. Part of the store's reputation for expertise usually results from the presence of a well-trained service department and a solid guarantee. The product line may include several models from one

manufacturer or a smaller number of models from several manufacturers. The offering is usually deeper than the offerings of other types of stores. This type of store need not be located in a shopping mall with heavy traffic; it might be located in a downtown or out of-the-way location because it appears that consumers will go out of their way to obtain the expertise offered by this type of store.

This type of store is often promoted by satisfied customers through word of mouth. However, some advertising must be done, and newspaper advertising is probably the most productive. The advertising will be modest. It may consist of regular classified advertising or small periodic display advertisements. The products sold through television specialty stores will be well-known name brands, often the best selling names in the industry. Thus, consumers need not be sold on the reputations of the brands carried by such stores. Price does not appear to be overly important to the customers of this type of store. They appear to be willing to pay the price in order to obtain the assurance that they are getting a high quality, name brand product that is backed by a good warranty and a qualified service department. In addition, it is this type of store that is most likely to take in old television sets on trade-in agreements. This type of store may have clearance sales, but only occasionally to clear out old stock or to keep the name of the retailer in the public's eye.

Personal selling is the key to the success of this type of specialty store. While it is very important for the salesperson to be knowledgeable about the product category, it is more important that the salesperson convey the message that "when you buy from us, we take the worry and the risk out of television purchases." These older shoppers may not be able to understand the technical nature of this product, so they will place their faith in the experts, that is, the salespeople in the store that specializes in this type of product. They are drawn to the store by its reputation, and then they rely on the brand names carried, the personal service and assurances they receive in the store, and the promises of good after-sales service to help them to make a purchase decision.

Variety Information Seeker Profile

The second largest segment of consumers found in this study were labelled the Variety Information Seekers, and they comprised 26% of the sample. This segment appeared to seek out a variety of different types of sources, with all of the members of this segment using, at least two different sources. The mean number of sources used by this segment was 2.88. Forty-four percent of this segment began their searches by using Consumer Reports magazine, while thirty-nine percent made a personal visit to a retail store first. Fifteen percent of this segment began their searches by looking at newspaper advertising.

Consumers using Consumer Reports first will be most likely to make a personal visit to a retail store second and half as likely to use the friend or relative source second. Consumers using the retail store visit first are almost equally as likely to use the friend/relative source or Consumer Reports magazine second. The use of the newspaper source is most likely to be followed by the use of the friend or relative source, while the use of the friend or relative source is most likely to be followed by a retail store visit.

The members of this segment tend to be well educated; they are most likely to have a bachelors or graduate degree. Their age is younger than the median, the age of their youngest child is below the median, their household income is below the median, and they possess purchasing experience below the median. The largest proportion of this segment indicated that they tend to conduct their information search first, which is followed by a brand choice, and then a store choice.

The members of this segment visited the largest number of stores, with the mean number of stores visited by this segment being 2.83. Members of this segment also asked more questions than average at the retail stores. This segment also rated brand reputation as being more important than the other segments rated it. This may explain the heavy inter-store search. Perhaps these consumers are searching from store to store to find the brand with the best reputation or

perhaps they are searching from store to store to find the best price or service on a particular brand with a good reputation.

Members of this segment preferred store types in the following order: (1) television specialty stores, (2) Wards and Sears, and (3) K Mart and Zayres - discount stores. Since Wards has begun offering a number of name brand televisions (such as Sony and Panasonic) in addition to its Wards brand, consumers are probably doing more comparison shopping there. At the time of this study, Sears sold televisions under the Sears brand name only.

Marketing Strategy for Appealing to Variety Information Seekers. This type of shopper is attracted primarily by a brand name product, but gives evidence that service may also be important. The Variety Information Seekers utilize three different types of information sources: commercial, personal, and neutral sources. A neutral source--Consumer Reports magazine--was heavily used by members of this segment as either the first or second source used. It is brand-oriented, and does not mention stores unless a store brand is being rated. The personal source--knowledgeable friends or relatives--was used by a large number of consumers in this segment. Two commercial sources--retail store visits and newspaper advertising--were also frequently used by this group. By looking at the combination of information sources used by members of this segment, it appears that they are seeking a more balanced view of what

the market has to offer. A major thrust of the marketing strategy for appealing to this segment is to build a quality product that will be highly rated by the consumer rating magazines. Since a high proportion of this segment reads such magazines early in their information searches, if a brand is not rated well then the consumer will not consider it further. After building a quality product, it becomes important for the manufacturer to build a quality product reputation, since that is what is most important to these consumers. Therefore, manufacturers will want to implement national advertising to promote the brand. They may also wish to motivate their dealers to do joint co-op advertising, particularly since these consumers seem to do a lot of inter-store search. The salespeople employed by these dealers must be knowledgeable, since the consumers in this segment are well educated, and they conduct somewhat thorough searches. A good brand reputation is important because it will be discussed when a knowledgeable friend or relative is asked for advice.

The manufacturer of televisions targeted at this segment will distribute to more retailers than the manufacturer targeting the One-Source Shoppers. The Variety Information Seekers will shop from store to store, and inter-store competition is stronger. Hence, the product may need to be available in television specialty stores and national chain stores to satisfy the Variety Information Seeker's need to shop and compare before buying.

Furthermore, the retailers should be located relatively near to each other to facilitate comparison shopping. The national chain stores will probably not carry as deep a line of televisions as the television specialty stores, but their offerings may be broader representing a larger number of manufacturers. Due to the greater competition among dealers serving this segment, prices will often be used as a point of differentiation and will, therefore, tend to be more competitive.

Advice-Seeker Profile

The Advice Seeker segment is the third largest consumer group, representing 15.5% of the sample. Slightly more than one-half of this group used only one source of information. The members of this segment were most likely to begin their information searches by obtaining advice from a knowledgeable friend or relative (42% of sample). However, about one-quarter of the segment began their searches by consulting a catalog, about thirteen percent used the Yellow Pages first, ten percent used magazine advertising first, and ten percent made a telephone call to a retail store first.

The most likely sequence between two information sources for this group is the use of a friend or relative followed by a personal visit to a retail store. Slightly less likely is the reverse of that sequence, which is the transition from retail store to knowledgeable friend or relative. The transition from Consumer Reports to store was

also in evidence for this group. Interestingly, this segment scored highest on the statement measuring enjoyment of shopping, but they exhibited the least inter-store search. The mean number of stores shopped was one. They also indicated that they did not perceive much difference between the offerings of stores for this product category. Store reputation was not as important to this group as the importance of making the right decision.

This segment can be characterized as being most likely to have a high school diploma. They fell below the median on the following: age, number of children, age of youngest child, education level, amount of purchasing experience and household income. The largest number of consumers in this group indicated that they had made up their minds before they began searching for new information. This group preferred to shop at Sears and Montgomery Wards by a large margin (i.e., approximately 45% "bought" there). Discount stores were second in importance to this group (23%), followed by television specialty stores (16%) and catalog houses (13%).

This segment exhibited the greatest use of magazines, Yellow Pages, and knowledgeable friends and relatives. They asked more questions of friends and relatives than members of the other segments did. They appeared to rely more on the advice friends and relatives either alone or in combination with Consumer Reports magazine, catalogs, Yellow Pages, or magazine advertising.

Marketing Strategy for Appealing to Advice Seekers

The key to reaching this segment is establishing and promoting positive word-of-mouth communications among consumers. Part of this task involves determining who the opinion leaders are so they specifically can be reached. These opinion leaders probably serve as sources of information about which brand to buy as well as from which store to buy. Since the members of this segment did not seem to think there was much difference between stores, it is the retailer's job to differentiate his store from other stores. The manufacturer will need to promote the brand, its reputation, and its features. The store, particularly the large national chain store like Sears, will need to tell consumers what they offer that is unique to that store. For example, Montgomery Wards might tell consumers that it offers both the Wards brand as well as nationally-known brands, reasonable prices, after-sales service, service contracts, credit, and good warranties.

It appears that some amount of newspaper advertising might be necessary. Advertising inserts in the newspaper might also reinforce the consumer's perception of quality and value. This may positively influence word-of-mouth communications. It is also important that the retailer advertise in the Yellow Pages. In addition, the manufacturer will need to ensure that the product is well made so that it is rated highly in the consumer rating magazines. These consumers will frequently take the advice-

giver's suggestion literally and buy the brand suggested. Hence, it is important that the advice givers (friends/relatives and Consumer Reports) are providing positive and consistent advice regarding products.

Judging from the types of stores where members of this segment purchased, it appears that price is somewhat important to these consumers. The availability of credit from these national chain stores might also be a factor in the purchase decisions of this segment. The location of these stores is not of utmost importance because the consumers seem to shop where they are advised to shop. However, many national chains and discount chains are located in regional or local shopping malls. These stores may use two different strategies with respect to product mix. First, they may decide to carry only the store brand, but to carry a very deep selection of store brands. Second, they may decide to carry both store brand and national brands, but the assortment may not be as deep. It appears that the latter strategy is being implemented more widely today.

Hence, to reach the advice seekers the firm must be sure that the advice givers are armed with plenty of positive information to pass along. This means communicating with former customers and opinion leaders as well as ensuring that the product is of high quality so that it will be evaluated highly by the ratings organizations. Since these consumers visit only one retail store, the

retail salesperson who hears the customer say, "My friend told me to come here for my color television," should make every effort to be helpful and to close the sale. That customer is not likely to have plans to go anywhere else to buy.

Seller-Provided Information Seeker Profile

The fourth category of search strategy was entitled the Seller-Provided Information Seeker segment, and it comprises 13.5% of the sample. All of the members of this segment used more than one source of information, with the mean number of sources for this segment being 2.67. Slightly more than half of this segment used newspaper advertising as their first information source, while over forty percent used catalogs as their first source.

The most common search sequence for this segment involved the use of newspaper advertising first followed by a personal visit to a retail store. The second most common search pattern for this segment involved the use of catalogs first followed by the use of newspaper advertising. The third most common search sequence exhibited by this segment involved the use of catalogs followed by a personal visit to a retail store. Whereas members of other segments often began their searches with a personal visit to a retail store, the members of this segment used the retail store visit primarily as their last source. The mean number of stores visited by this segment was 2.6. Seller-provided Information Seekers asked more than the median number of

questions while visiting retail stores. Hence, the retail store source was used rather intensely.

Members of this segment are most likely to have a high school diploma. The segment falls below the median measure on each of the following variables: age, number of children, amount of purchasing experience, age of youngest child, education level, and household income. They reported that they are most likely to search for information and then make a store and brand choice simultaneously. This segment rated newspapers as the easiest source from which to acquire information. They rated store visits the least useful and newspaper advertising as most useful out of eight sources.

One-third of the Seller-provided Information Seekers made their "purchases" from Sears and Montgomery Wards; approximately 30% "purchased" from discount stores; and about 26% "purchased" from television specialty stores. Only 11% "purchased" from a catalog showroom. It stands to reason that Sears and Wards received the highest proportion of sales because this segment used catalogs rather heavily. Since they also rely on newspaper advertising to a great degree, it is also understandable that they would shop in discount stores, which are generally heavy users of the newspaper advertising medium.

Marketing Strategy for Appealing to Seller-Provided Information Seekers. In order to reach this segment of consumers, the retailer needs to utilize two primary media, those being newspaper advertising and catalogs. Those

stores that do not normally use catalogs might wish to consider issuing mini-catalogs or multi-page newspaper inserts. This segment of consumers seems to rely quite heavily on the seller for information before buying. This reliance extends to the retail store prepurchase visit. While newspaper advertising or catalogs may be useful, the consumer often needs to acquire more information by personally inspecting a product or by asking questions of the retail salesperson.

In addition to advertising, the retailer needs a capable and knowledgeable sales force to close sales. Once customers are attracted by advertising, the store would not want to lose them because of incompetent salespeople. Since some of these sales may be made by ordering through the catalog, it is also important that the order/delivery system is efficient and that merchandise is handled carefully.

Price appears to be a major factor in the purchases made by this segment. These consumers are predominantly national chain or discount store shoppers, which indicates that they are looking for an acceptable level of quality at a lower price. The fact that they read the newspaper for advertising is evidence that they may be watching for sales. They rated the "importance of making the right decision" lower than any other segment, which indicates that they were more interested in acquiring a product rather than the best product.

The range of offerings found in national chain stores (like Wards) and in discount stores (like Zayres) is usually quite broad. In national chain stores, one might find a selection of the store brand at various price points as well as a selection of name brand products at various price points. In discount chains, one is more likely to find a larger number of brands that range from inexpensive to expensive. Somewhat unfamiliar brands may be offered at the low end of the price scale. Consumers do not expect much depth in each brand's line.

The stores selling to this segment will normally be located in higher traffic areas--shopping malls. For the retailer to be able to sell merchandise at lower prices, there must be a higher volume to justify the lower markup. Since there is substantial inter-store search, the retailer needs to be relatively close to other retailers selling similar merchandise. They appear to determine what is available in the marketplace by gathering a substantial amount of prepurchase information before visiting any retail stores.

Information Intensive Shopper Profile

The smallest cluster of subjects comprise the Information Intensive Shopper segment, which was 9% of the sample. Members of this group used the most number of different sources (with a mean of 3.8 information sources), which is why they were labelled "Information Intensive Shoppers." Hence, they appear to determine what is

available and then gather information about the available brands before returning to the store for a last look. The mean number of stores shopped in was 2.4 for this segment. Every member of this segment exhibited the source usage transition from Consumer Reports magazine to catalog usage. Other frequently used transitions were between: (a) catalogs and stores, (b) catalogs and newspapers, (c) friend/relative and store, and (d) newspaper and friend/relative. They appear to utilize quite a variety of information sources, but they all have the Consumer Reports source usage in common.

Astoundingly, this segment rated Consumer Reports less useful than the other segments rated this magazine. Information Intensive Shoppers are the most likely cluster to have a bachelors, graduate, or advanced degree. Their education level is above the median, as is their household income. They are younger than the median age, and their youngest child is likely to be twelve years old or younger. They say they are most likely to search for information, make a brand choice, and then make a store choice. Forty-one percent of this group "purchased" from a television specialty store, while thirty-seven percent "purchased" from Wards or Sears, and fifteen percent "purchased" from K Mart or Zayres. One cannot be sure, but one might guess that the television specialty stores are where the best-rated televisions are sold. Furthermore, the catalog users must go to the stores issuing the catalogs (Sears and Wards).

Since there was a good deal of catalog browsing by subjects in this segment, it is reasonable to expect that a high proportion of these consumers would make a purchase from a store that sells by catalog.

Marketing Strategy for Appealing to Information Intensive Shoppers. The Information Intensive Shoppers appear to be highly involved in the purchase. They rely on a number of different information sources involved in the purchase, particularly since they rely on a number of different information sources. They are most likely to shop at, and purchase from, a television specialty store or a national chain store. Discount stores and catalog showrooms did not hold great appeal for this segment.

Once again, the product must be one with the highest quality because it must have a good rating in Consumer Reports or another consumer rating magazine. This is because the entire group relies on this neutral source early in the decision process. The retail stores must stock the best-rated products to appeal to this group. The retailer must hire knowledgeable salespeople to deal with this better educated group of consumers. Since the members of this group have higher than average household incomes, they can afford the top-of-the-line products. They will understand that one must pay more to get a superior product; that better products usually last longer; that better products are an investment.

Both national brand advertising and retail advertising are necessary to reach and convince this segment. They must be made aware that certain brands are more reputable and desirable than others. That is the job of the manufacturer. The retailer must advertise in the local newspapers to bring these consumers to his store. Newspaper advertising must convince consumers that a particular store offers the best selection of products with the best after-sales service, guarantee, trade-in deals, etc. Catalogs are essential for national chain stores because they do a large proportion of their business through direct-mail marketing. Word-of-mouth communications between consumers is also an important influence on this segment's purchase decisions. Similar to the variety information seekers, this segment uses: (a) personal sources, (b) neutral sources, and (c) commercial sources of information prior to purchasing a durable good.

The television specialty store need not be located in an expensive shopping center; rather, it can be located in a downtown business district with significantly less traffic. This is, of course, due to the fact that these information seekers will purposely seek them out. However, national chain stores need more traffic and higher visibility to be successful. In order to summarize the marketing strategies for reaching the five search strategy segments that have been described here, Figure 11 is provided.

Figure 11. Summary of Marketing Strategies for Reaching Consumers with Different Search Strategies

Search Strategy Segment	Price Element	Promotion Element	Place Element	Product Element
One-Source Shoppers	Mod.- High Price	Word-of- mouth Newspaper Salespeople	High Traffic Area not Essential	Deeper Product Line
Variety Information Seekers	Mod. Price	Brand adv. Dealer co-op Salespeople	Higher Traffic area needed	Broad and Deep lines
Advice Seekers	Mod. Price	Word-of- Mouth Consumer Reports Stores need to differ- entiate	Location may not be as imp. due to the importance of advice	Lines Broader than deep
Seller- Provided Information Seekers	Lower Priced	Newspaper adv. Catalogs Salespeople	High Traffic Malls	Lines Broader than deep
Information Intensive Shoppers	Higher Priced	Consumer Reports Catalogs Store Visits Salespeople Advertising Word-of-Mouth	Both Low and High Traffic Areas	Deeper Product Lines

Implications of Other Research Findings

Several other research questions were investigated in this research which may have implications for marketing managers. They will be discussed below.

Research Question 1a holds very important implications for marketing managers at both the retailer and manufacturer levels. The data suggested that some information sources are more likely to occur before/after other information sources. Whereas the personal visit to the retail store is the most frequently used source as the first source used, as the last source used, and in overall use, one would expect that it would be a part of the most frequently exhibited two-source search sequences. The personal visit to the retail store was involved in sixty percent of the ten most frequent two-source sequences. For a large number of people, the retail store visit was the only source used to make a purchase decision. For many others, it was the last source used in order to make a purchase decision. For some others, it was the first place to gather information against which further information would be compared and evaluated.

The implication for manufacturers is that they should build a strong dealer network because the retail outlet is a major information source for most consumers. Distribution policy and strategy should be established with this in mind. Brand advertising combined with a listing of the authorized dealers in an area makes good sense from the manufacturer's point of view. It reinforces the brand image while, at the

same time, informing consumers where the brand is available. The implication for the retailer of color televisions is that when most consumers enter the retail store they may be close to making the purchase decision. The data from this study suggest that consumers are much more likely to end (than start) their information searches at a retail store. Hence, it is extremely important that the retailer hire salespeople who can determine their customers' needs and offer the right product to meet their needs.

Many retail stores probably lose sales unnecessarily through the incompetence or ignorance of their sales help or by not even hiring specific salespeople to handle the sale of big-ticket items. One of the most important elements of the retailer's marketing mix for durable goods is personal selling. These salespeople require thorough and frequent sales and product training as well as a compensation plan that rewards them for good performance. Too often retail salespeople are paid a salary that is too low to retain those who are good at their jobs. Retailers may need to do more in the areas of recruiting, training, and rewarding those people in the durable goods sales force. It seems a shame, but the retailer often loses sales just at the point where a good salesperson could be turning the situation into a sale. The importance of personal selling on the retail level for relatively expensive and/or complex durable goods cannot be overemphasized.

The most frequently exhibited complete information search sequences were presented in Chapter 6, and their implications for marketing managers will be discussed next. As the data have shown previously, the use of the personal visit to the retail store(s) was the most popular search strategy, with about one in three people using only this source. Once again, this reinforces the importance of the retail store environment and personnel as a source of prepurchase information for a durable good.

The search path with almost a 6% probability of occurring involved only the use of the knowledgeable friend or relative source. This certainly points out the importance of word of mouth since these consumers made up their minds based only on what a friend or relative told them. It is important to be in touch with your customers to be sure they are satisfied with your products because their positive word of mouth can produce additional future sales. Satisfied customers are kept satisfied through the sale of products with consistent quality and efficient service. Good management of these qualities is essential over time.

The search path with slightly over 5% probability of occurring involved only the use of store catalogs, such as Sears or Wards catalogs. The search path involving first the catalog source and then the retail store visit had over 1.6% probability of occurring. It seems as though catalogs provide enough descriptive copy and photographs for some people so that they are confident enough to make a purchase

decision without personally examining the product. Other consumers may narrow down the products or brands they would consider buying by first viewing them and reading about them in a catalog. Then they will visit the retail store to inspect a smaller number of items in which they are interested. They may also have questions to ask the retail salesperson during their store visit. They need additional information that they perceive only a store visit can provide.

However, it is the practice of many catalog marketers to offer a strong guarantee so that the customer knows the product can be returned if it is not satisfactory. This type of strong guarantee/warranty might be adopted by retail stores in an effort to instill greater prepurchase confidence in the buyer and to reduce the amount of post-purchase cognitive dissonance at the same time. One successful color television dealer offered his own warranty terms, which were longer and more inclusive than the manufacturer's warranty. This practice builds confidence in both the dealer and the brand because the customer sees that the dealer possesses so much confidence in the manufactured brand that he personally backs it and is willing to extend the warranty coverage.

Another search path with slightly more than a 5% probability of occurring begins with the use of newspaper advertising and ends with a retail store visit. There is also the search path that involves only the use of the

newspaper advertising source, with about a 3.7% probability of occurring. Another search path involving first newspaper advertising, then a knowledgeable friend or relative, and then a retail store visit had approximately 1.6% chance of occurring. Newspaper advertising is a frequently used information source by consumers of all types of goods.

When the ads of several retailers appear in the newspaper, the consumer is often able to compare products and stores without ever going to the store. It is possible that a particular advertisement may stimulate the consumer's interest and help him/her to recognize that a need exists and that the retailer or the retailer's product can help to satisfy that need. Perhaps the retailer's ad is properly targeted to a specific market with the appropriate benefits, products, prices, and services offered.

However, it is also possible that there are some consumers who scan the newspaper over the long term; and when the right offer is made to the consumer, the consumer is ready to buy because s/he is familiar with the previous offers that have been made. For example, the consumer may watch ads on a regular basis for a particular product. This consumer knows the price range for the product category and recognizes when it is on sale at a particularly good price. When the price is right, relative to previous ads, the consumer will run out and buy it at the new sale price.

Hence, a decision can be made by using only newspaper advertising as a source.

Other consumers will not make their final purchase decision until they make a personal visit to the retail store and personally inspect the product and/or discuss it with the retail salesperson. It is important that the advertising be truthful and not misleading in any way, otherwise the sale may be lost after the customer becomes disillusioned or annoyed about being misled. If an ad pulls a customer into a store, then this customer is a very good prospect and is practically sold on the product.

Once in the store, this customer will only be lost through poor personal selling, misrepresentation of the product or sales terms, or product unavailability. Hence, the retail salesperson should know that the customer is an excellent prospect if s/he is responding to a newspaper advertisement or circular. By asking the customer what brought him or her into the store, the salesperson can quickly determine what information sources have been used previous to the retail store visit.

The consumer who first reads the advertisements in the newspaper and then consults a knowledgeable friend or relative is perhaps one who does not feel capable of making the decision alone. The friend or relative may be sought out to obtain further information, to confirm a tentative purchase decision, or to aid in the actual purchase decision. As a result of the friend's or relative's advice,

this consumer then visits the retail store and subsequently makes a purchase. Once again, the retail salesperson should make the determination about what sources the customer has used previously. If the customer indicates prior use of newspaper advertising and knowledgeable friend or relative, the salesperson should know the customer is there to buy.

Finally, the search path with over a 5% probability of occurring involved only Consumer Reports magazine. Another search path involving Consumer Reports, then catalogs, and then a retail store(s) visit possessed a 3.1% chance of occurring. A third search path involving Consumer Reports, then catalogs, then a knowledgeable friend or relative, and then a retail store visit had a 1.6% chance of occurring. Although it has been stated that the methodology may have contributed to the overuse of the Consumer Reports source, it appears that some consumers possess enough confidence in this source to make a purchase decision based only on Consumer Reports product ratings.

However, it appears that the "information sensitive" consumer who is known to use Consumer Reports is evident in the results. The four-source sequence contains a neutral source, two commercial sources, and a personal source. Consumer Reports readers tend to have big appetites for information, and will utilize all types of sources to satisfy their curiosity. When marketing to this type of consumer, the marketer must be sure that the consumer is

provided with complete information through a variety of sources, but definitely in print media.

Hypothesis One investigated whether consumers would use the source they rated as "easiest to acquire information from" first in their information search sequences, while Hypothesis Two investigated whether consumers would use the source they rated as "most useful" first in their information search sequences. Evidence was found for both hypotheses, therefore, it appears that both attributes of an information source are important reasons for utilizing that source early in the search process.

It appears that if consumers are given the choice between using a source from which information is easiest to acquire or using a source that is most useful, more consumers would choose the source that is most useful. Whereas consumers are often accused of being lazy, this information indicates that consumers will actively go after the information they perceive to be most useful in a particular purchasing situation. Information that is easy to acquire will not necessarily be sought after if it is not useful, too. Most consumers go about their information searches in a most efficient manner. That is, they determine the source or sources that will provide them with the "right" amount and type of information they need to make a purchase decision.

Why bother with an information source that is relatively easy to acquire information from when another

source that requires more effort to access will provide more useful and perhaps more relevant information for decision-making purposes? The managerial implication of the findings from these two hypotheses is that the marketer must offer consumers information that they perceive to be useful. Whereas some consumers might believe that Consumer Reports magazine is the most useful information source regarding product comparisons, apparently many consumers do not believe it is the most useful source of information. The retail store evidently provides the most useful information to consumers since it is used to the greatest extent. This would imply that consumers want to be able to see the product in operation and want to obtain specific information from a salesperson. If this is so, then perhaps other or newer information sources might attempt to provide similar, useful information.

If "seeing is believing" then marketers may wish to do more marketing via television, cable television, and videotape advertising. Since many durable goods require demonstrations, the use of video for this purpose would be the next best thing to actually viewing the demonstration in person. A few enterprising direct marketers have started selling using a "videologue"--a catalog on videotape. While many consumers might be averse to buying big-ticket durable goods through the mail, the concept of the videologue could be adapted by retailers who might lend out informational product videotapes on their complex products for previewing

before buying. Chevrolet has recently offered consumers a floppy disk with information about different Chevrolet products. The consumer is able to pick and choose the options desired on a vehicle, and the computer program calculates the final cost of the vehicle for the consumer. In this way, the consumer is quite capable of conducting a prepurchase search (among Chevrolet products) and "build" the car or truck s/he desires.

In addition, the video presentations could be prepared with the most commonly-asked questions and the most commonly-heard objections integrated into the presentation.

While the print media are not as realistic as the media which use video, they can also be utilized more effectively to provide the type of information consumers look for when visiting the retail store. Newspapers are beginning to use equipment that is capable of better color reproduction. The addition of quality color to an already popular information source--newspapers--will make product advertisements more realistic and true-to-life than they formerly were. This should make this source even more useful to consumers.

The direct mail medium allows the marketer to personalize the selling message while, at the same time, providing high quality graphics and a large amount of information. This type of information may be perceived as being useful by consumers if marketers are able to pinpoint those consumers who have a need for a particular product. Perhaps, this type of direct marketing would be more

successful if it were combined with a toll-free hotline. In this way, consumers would be able to use the hotline to get answers to questions raised by the direct mail piece. Good sales leads could also be obtained in this manner.

The point to be emphasized here is that consumers want information that is useful, not information just because it is easy to acquire. Useful information is information that is relevant to the specific purchasing problem and the specific needs of the consumer. Relevant information is most frequently found in the retail store because that is where the products are displayed, demonstrated, and explained. The knowledgeable retail salesperson can also answer the consumer's specific questions. There seems to be no other source that can provide all of these types of information. Video sources can provide much of the useful information that consumers are looking for, and two-way cable might prove to be even more useful. Print media alone can provide a good deal of information, but the demonstration is often hard to accomplish in print and there is no opportunity for feedback unless print advertising can be followed up by mail, telephone or personal interaction between the marketer and the consumer.

Marketers must be sure that they are providing consumers with information that is perceived to be useful by consumers. In some cases, the marketer may want to tell the consumer that the information is important for the consumer to know and why it is important. This may include

information about the marketer's point of differentiation. The marketer should be knowledgeable about the criteria used by consumers to evaluate brands in a product category. The promotional message should provide information which enables the consumer to evaluate a particular brand on the important purchasing criteria. At the same time, the results of this study suggest that if the useful information that the marketer provides is relatively easy to acquire and comprehend, then consumers will be more likely to acquire that information first.

Implications for Marketing Researchers:

Limitations

The major limitations of this research stem primarily from three major areas. These three areas include: (1) the focused nature of the study involving only one product category, (2) the limited geographic sampling area and small sample size, and (3) the use of the computer interactive data collection methodology to track the consumer's search and decision-making processes, and (4) the research methodology used, especially the operationalization of variables representing search sequence. The limitations are discussed in more detail below.

Limitations of Studying Consumer Search Behavior for Only One Type of Consumer Durable

This study investigated only the information search and decision-making processes of consumers of one type of durable good--color televisions. Search for this type of

_____ durable may be quite different from search for other durables, such as furniture, major household appliances, and automobiles. In addition, the distribution channels for color televisions may be very different from other types of durables. The types of sources of information used by consumers in their search for different durables may also vary. It is possible that consumers might shop for color televisions like they do for no other product. Furthermore, there is the purchase situation in which a consumer buys more than one durable good at the same time. This research did not address the multiple-product purchase, and it would not represent the purchasing behavior of consumers who buy multiple products simultaneously. Hence, generalizations of the findings of this study are limited and may not be applicable to other durable goods.

Sampling Limitations

This study was based on the analysis of data collected from two hundred one subjects in one sample and twenty-five subjects in another sample. Given the large number of variables and possible combinations of variables, the samples are relatively small. The findings of this study are tentative and would require replication using a substantially larger sample.

This study was conducted in a limited geographic area. It was carried out in one county with a relatively small city, which serves as the area's major commercial center. This area is relatively rural in nature, with the largest

city in the county having fewer than 25,000 inhabitants. One might expect, therefore, that consumers would have a limited assortment of goods available to them in area stores. Furthermore, consumers in this area may shop differently, utilize different information sources, and they may find it necessary to go outside of the immediate market to find what they are looking for.

In addition, the market structure is probably unique. That is, the number, type and location of retail stores may differ from market to market. Even another community of approximately the same size would in all likelihood contain different stores, shopping centers, locations, and product assortments. The market sampled for this study would also be quite different from an urban market place.

Given the population and area from which the sample was chosen, the ability to generalize from this study is limited to other areas with similar demographic, socioeconomic, and psychographic composition and market structure.

Limitations of the Data Collection Methodology Used

This study involved a computer-simulated laboratory information search and decision-making process task. The use of the computer for tracking how consumers shop and search for information before they buy is a promising new process methodology, but it is not without its problems. The problems are rooted in the fact that this was a laboratory study and that the computer was used for data collection purposes.

Whereas it would be desirable to track consumers' actual search behavior, this type of research would be virtually impossible. There is the problem of time--some consumers search for very long periods of time before purchasing. There is the problem of locating subjects at the exact point in time when they have made the decision to conduct an external search. There is also the problem of locating the small percentage of the population who are in the market for a specific durable good at the same time the study is being conducted. Furthermore, consumers' actual information-seeking behavior may be influenced by their knowledge that their behavior is being studied.

A laboratory simulation of information search and decision making can overcome most of these problems, but may introduce other, quite different problems. First, a simulation places subjects in a "let's pretend" situation. Subjects may not approach the simulation as seriously or in the same manner as they would an actual purchase. Second, the simulation was conducted totally through the subjects' interaction with a computer terminal. Some subjects may have been apprehensive about using a computer terminal. The evidence produced by this study suggests that the computer interactive methodology may result in the under-acquisition of prepurchase information. In addition, the information which the subjects accessed in the simulation was not in exactly the same form as the information they would acquire in an actual search. For example, the subjects were not

able to see the product in person; instead they viewed photographs of the products. Personal recommendations that would be given verbally by friends or relatives were offered in written form on the computer screen. Hence, the form of the information as well as the manner in which information is acquired differed from actual search behavior.

Not only was the information not in the same form as it would be found in the marketplace, but a time-cost factor was included in the study to represent the amount of time and effort it would take to access each different information source. These time costs, however, were standardized and each respondent was charged the same time costs for accessing the same information sources. The respondents' perceptions of the amount of time and effort for accessing the same information sources are probably not the same, however, and this may be a source of irritation to some. Furthermore, Brucks (1984) suggested that sitting in front of a blank computer screen might not be associated with actual shopping activities; that the computer shopping exercise may be a more enjoyable or a more aggravating experience for the subjects in the study.

A serious limitation of the simulated purchasing task resulted from a combination of (a) the choice of the color television category and (b) the inability of subjects to personally examine the product. A major evaluative criterion used by consumers to judge color televisions is the quality of the color picture. Since the actual product

was not available to the subject, the subject could not evaluate this attribute personally. Information search in the actual market place frequently involves demonstrations, trials, seeing, and touching. The computer simulated purchasing task did not provide these types of stimuli to subjects, therefore, the subjects had to use alternate information sources that would allow them to judge color picture quality in a different way. Hence, it appears that the subjects may have used the Consumer Reports magazine source to evaluate picture quality because they could not personally inspect the products and evaluate this attribute for themselves. The evidence in this study that supports this observation was the inordinately high proportion of the sample that acquired information from Consumer Reports. Furthermore, Smead, Wilcox, and Wilkes (1981) found that consumers respond differently to verbal product descriptions than to actual products. Hence, the prepurchase behavior and/or purchase decisions may not reflect how consumers would actually behave if they were presented with genuine information sources.

Third, in an attempt to contain the study to a reasonable length of the subjects' time, not all information sources that are available in the real-world environment were included in the simulated purchase environment. Only representative stores from the specialty store, discount store, and national chain store categories were used. A major store in this particular market area was not included

because it had been destroyed by fire at the time the computer program was being written.

Additional reasons for not including all of the possible information sources in the simulated purchasing task included the inability to obtain actual television and radio commercials as well as the current insufficient graphics capability of microcomputers and the low involvement nature of broadcast advertising. The information sources included in this study, however, are those sources cited as being most frequently used. In addition, it may be difficult for some subjects to compress behavior that would normally take up to several months into the space and time of a laboratory simulation.

Fourth, the problem of interviewer bias was greatly reduced since the researcher was minimally involved with the subject. However, subjects may still have reported search behavior that was different from their normal behavior for several reasons. During the simulated purchasing exercise the subjects may attempt to appear more rational in their purchasing behavior than they normally are. They may not know what their normal purchasing behavior patterns or strategies are and, hence, may be unable to reproduce their normal behavior in a simulated exercise. They may perceive the computer simulation to be a game and, therefore, may "play too long." This would tend to overestimate the search process greatly, while the computer-apprehensive individual may rush through the search process faster than normal and

under-report search behavior. Thus, while the interviewer bias problem may be minimized in a simulation study using the computer for data collection, the motives, abilities, and perceptions of the subjects regarding the study and its implementation may introduce a different, but equally harmful, type of bias.

Fifth, since the subjects in this study were paid for their participation, they may have responded differently in order to give the researcher her money's worth. For example, some subjects who might have ordinarily used only one information source before making a purchase decision might have used two or three information sources to make it appear as if they were taking the study seriously.

Limitation of Operationalization of Search Variables

This research methodology possesses another weakness which stems from the manner in which the variables representing the search sequence were operationalized. Sequence was operationalized using basically three types of variables. One of the sequence variables measured "which information source was used first" and another sequence variable measured "which information source was used last" by each respondent. The primary variable type used for representing the search sequence involved the use of transitions from one information source to another. These transitions, representing the use of two information sources, were used as clustering variables while other transitions involving more than two information sources were

not used. Hence, the weakness in the operationalization of the sequence variables is the result of not using each subject's full search sequence in the clustering procedure.

The implications of this research to other marketing researchers are as follows. The computer interactive data collection methodology is a viable research technique, however, it has some limitations that will affect the quality and quantity of data collected. It is a laboratory technique with all the inherent weaknesses of the laboratory. Subjects may not approach a laboratory task in the appropriate frame of mind, with the right attitude, and with correct perceptions about the task. The researcher may not be able to duplicate the real-world environment in the laboratory with the same number and types of information sources in their natural form. Other marketing researchers are cautioned about making generalizations from this data because this study involved only one type of consumer durable good, only one small geographic area, and relatively small samples.

Suggested Future Research

Given the results and the discussion of the hypotheses testing, the discussion of the implications for marketing managers, and the limitations of the research results and methodology, it is important to discuss the most promising future avenues of research. Five suggestions for future research follow here.

First, future research should attempt to utilize this research methodology to study prepurchase information seeking for other types of durable goods. The sequential prepurchase information seeking process requires study for durable goods that have different distribution systems, different price ranges, different promotion strategies, and different purchasing criteria. Past studies have shown that shopping for televisions is different than shopping for other types of durables, hence, the importance of applying this methodology to the information search process for a variety of durable goods.

Second, it is suggested that a wider range of shopping environments be incorporated into the computer program and consumers from a wider geographical area be chosen to perform the computer-simulated search and decision-making task. The study reported herein incorporated the market structure of a relatively small city. The types of stores found in this market, the number of brands available, and the level of competition found in this market would vary markedly from markets that are larger or smaller. Therefore, it is important to offer subjects the type of market structure that they would normally find in their immediate environments. This research was conducted in a rather isolated community in the northeast corner of New York State with a total of 226 subjects. It is possible that the people who reside there represent a "special strain" of humans and that their consumer behavior is not

representative of the state, region, or country. In order for this type of research to be generalizable, a larger and wider cross-section of consumers would be necessary.

Third, this study offered subjects the choice of eight different information sources found in their environment. The list of information sources was not collectively exhaustive, however, in that all of the available information sources to be found in the marketplace were not included in the study. For example, television and radio advertising were not offered as an information option. Only three magazines and one newspaper were offered as options in those media categories. Other media, such as out-of-home advertising and sales promotions, were also not part of the information environment offered to the subjects in this study. It is suggested that the number of information sources offered and the alternatives offered under each information source be increased to better reflect the actual information environment. In order to implement this suggestion, however, the researcher will have to spend more time and effort in setting up the computer program before the data collection can begin. The amount of data gathering, planning, and computer programming for this study using only eight information source types was substantial. To offer a more realistic information environment will require even more time, effort, expertise, and financial support.

Fourth, the computer-simulated purchasing task would run more smoothly and would seem more realistic if certain technical improvements could be made. For example, if the graphics could be integrated into the computer program then almost all of the information obtained by the subject could be viewed on the computer/television screen. If moving videos could be used instead of still pictures, the store visit and personal inspection of the product might seem to be more realistic. If a "mouse" could be used instead of requiring the subject to hunt and peck for the proper key on the keyboard, the subjects' apprehension toward the task might be alleviated somewhat. If waiting costs for accessing each of the information sources could be individualized according to each subject's perception of the cost of acquiring information from each source, then a truer measurement would be obtained from each subject. These are the major areas where there is opportunity for improving the technical dimension of this research methodology.

Fifth, there is a definite need to conduct more research to determine the validity of the computer-simulated interactive data collection methodology. The primary concern here should be the determination of whether the computer-simulated purchasing task is measuring normal information-seeking behavior or whether it is measuring subjects' responses to the research situation or to the measurement instrument. The determination of the validity

of this relatively new research methodology will require the use of the multi-method approach to research.

Epilogue

The computer-interactive data collection methodology is a promising marketing research tool. Its potential for the accurate measurement and recording of data is great, but more research needs to be done to ensure that the resulting data are valid and reliable. The data generated by, and analyzed in, this study suggest that there are five general sequential search strategies used by consumers in their quest for a durable good. These search strategies differ from each other in terms of the amount of search, the information source type(s) used, and the sequence of search. The data reveal that certain information sources are more likely to precede or follow certain other information sources. Hence, the sequence of information source usage appears to follow certain patterns and is probably not a random occurrence. Consumers who utilized a neutral source, such as Consumer Reports magazine, also appeared to exhibit more extensive prepurchase information seeking than consumers who did not use this type of source. Furthermore, the first source used by consumers appears to be a function of both the perceived usefulness of the source and the ease of acquiring information from the source.

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APPENDIX A-1

Operationalization of Stage I, Individual Variables

The individual variables that were used in this study were chosen as a result of previous research that indicated there was a relationship between each of these variables and external search behavior. The Stage I, individual variables will be operationalized below.

Demographic and Socioeconomic Variables

- (1) Sex: Are you Male or Female?
- (2) Age: Into which age category do you fall?
18-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60 to 64, or 65 and older.
- (3) Marital Status: Regarding your marital status, are you (1) single, (2) married, (3) divorced, separated, other?
- (4) Number of Children: How many children do you have? (0) none, (1) one, (2) two, (3) three, (4) four or more.
- (5) Age of Youngest Child: What is the age of your youngest (or only) child?
(1) under 6, (2) 6 to 12, (3) 13 to 18, (4) over 18.
- (6) Education Level: What is the highest level of education you have finished?
Some Junior High or High School; High School; Some College coursework, but no degree; Associates Degree, Bachelors Degree; Masters Degree; Professional/Doctors degree.
- (7) Number of Income-Earning Adults in Household: How many adults in your household are income earners?
(0) none, (1) one, (2) two, (3) more than two.
- (8) Household Income: Approximately what is your total HOUSEHOLD income?
Under \$10,000 per year; \$10,000-19,999; \$20,000-29,999; \$30,000-39,999; \$40,000-49,999; \$50,000 and over per year.

- (9) Vehicle Ownership: Does your family own a car, truck, or van?
(0) no or (1) yes.

Psychological Variables

- (1) Knowledge of Product Class:

Have you EVER owned a color television? yes or no
Do you NOW own a color television? yes or no
Regarding the color television product category, how
KNOWLEDGEABLE do you think you are?

Very Knowledgeable_1___2___3___4___5___6___7_Very Uninformed

- (2) Color Television Purchasing Experience:

Over the last ten years, How many times have you made a
color television purchase decision?
(0) none, (1) once, (2) twice, (3) three times, (4)
four or more color television purchases

- (3) Previous Store Experience:

Have you ever purchased ANYTHING from (name of store)?
yes or no

- (4) Knowledge about Stores:

How knowledgeable do you think you are about the STORES
that sell color televisions?

Very Knowledgeable_1___2___3___4___5___6___7_Very Uninformed

- (5) Attitude Toward Ease of Accessing Information Sources:

(Newspaper Advertising) is an information source that
is:

Very Easy to _1___2___3___4___5___6___7_Very Difficult to
Acquire Information From Acquire Information From

- (6) Attitude Toward Usefulness of Information Sources:

In a color television purchase decision, (Newspaper
Advertising) is a:

Very Useful_1___2___3___4___5___6___7_Very Useless
Information Source Information Source

(7) Confidence in Ability to Evaluate Product Category:

How Confident are you with respect to your ability to evaluate BRANDS in the color television category?

Very Confident_1___2___3___4___5___6___7_ Not Very Confident

(8) Confidence in Ability to Evaluate Retail Stores:

How Confident are you with respect to your ability to evaluate STORES which sell color televisions?

Very Confident_1___2___3___4___5___6___7_ Not Very Confident

(9) Importance of Product/Involvement in Search:

In the color television product category, how important is it that you search until you find, JUST THE RIGHT BRAND?

Very Important_1___2___3___4___5___6___7_ Very Unimportant

(10) Perception of Diversity of Color Television Brands:

With respect to color television brands in the marketplace,

Color TV Brands are Very Different_1___2___3___4___5___6___7_ Color TV Brands are Very Similar

(11) Perception of Diversity of Sellers of Color Televisions:

With respect to those retail stores selling color televisions in this area,

The Stores' Offerings are Very Different_1___2___3___4___5___6___7_ The Stores' Offerings are Very Similar

(12) Enjoyment of Shopping:

I Enjoy Shopping_1___2___3___4___5___6___7_ I Do Not Enjoy Shopping

(13) Measure of Brand Loyalty:

After the subject has made a purchase decision in the simulated shopping exercise, the subject is asked whether s/he ever owned that brand before. If the subject responds "yes," then brand loyalty is considered to have occurred.

(14) Measure of Store Loyalty:

After the subject has made a purchase decision in the simulated shopping exercise, the subject is asked whether s/he ever purchased a television from the store chosen in the computer shopping exercise. If the subject responds "yes," then store loyalty is considered to have occurred.

(15) Importance of Economizing:

When you were "shopping" today for a color television, how important was it for you to try to save money?

Very Important_1___2___3___4___5___6___7_Not Very Important

(16) Importance of Brand Reputation:

How important was the brand's reputation for performance and quality in your purchase decision today?

Very Important_1___2___3___4___5___6___7_Not Very Important

(17) Importance of Store Reputation:

How important was the store's reputation for product assortment and service in your purchase decision today?

Very Important_1___2___3___4___5___6___7_Not Very Important

APPENDIX A-2

Operationalization of Stage II Variables

The Stage II variables, which are the variables that describe the depth, sequence, and content of the consumer's information search, will be operationalized here. Some important groundwork was laid by Jacoby et al. (1977) in that they developed a table of possible information acquisition variables relevant to the search dimensions of depth, sequence, and content.

Variables Characterizing Depth of Search

- (1) Number of different information sources used out of eight possible primary information sources used in the study (magazine advertising, catalogs, Yellow Pages, visits to retail stores, newspaper advertising, knowledgeable friend or relative, CONSUMER REPORTS, and telephone call to retail store).
- (2) Extent of usage of each information source:
 - (a) Number of magazine advertisements accessed
 - (b) Number of different stores' catalogs accessed
 - (c) Number of Yellow Pages headings accessed
 - (d) Number of different friends or relatives consulted
 - (e) Number of different retail stores called on the telephone
 - (f) Number of different retail stores visited
 - (g) Number of questions asked during store visits
 - (h) Number of questions asked during telephone calls to stores
- (3) Length of time spent in simulation
- (4) Proportion of information acquired to total amount available

Variables Characterizing Sequence of Search

- (1) Percentage of subjects beginning search sequence with each type of information source

- (2) Percentage of subjects ending search sequence with each type of information source
- (3) Measures based upon a sequence of two values:
 - (a) Proportion of each transition type; a transition occurs when the subject requests information from a different primary information source.
- (4) Measures based upon a sequence of more than two values but less than the full sequence:
 - (a) Proportion of three-source transition types
 - (b) Proportion of four-source transition types
 - (c) Proportion of five-, six-, seven-, and eight-source transition types (if there appear to be common transition types of this length)
- (5) Measures based upon a full process sequence (Jacoby et al. 1977, p. 309):
 - (a) Jacoby et al. (1977) suggest the use of transition vectors, as well as the raw data matrix, for analyzing the full set of process data.

Variables Characterizing the Content of Search

- (1) An analysis of each information source will reveal whether it provides brand information, store information, or information on brand and store.
- (2) If the Telephone-a-Retail-Store information source is accessed, then the search can be analyzed by (a) the type of store called, and (b) the type of question asked (what brands do you carry, what is the price range, what are the store hours).
- (3) If the Visit-a-Retail-Store information source is chosen, then the search can be analyzed by (a) the type of store visited, and (b) type of information acquired in the store (brand information, financing, repair service, salesperson recommendation).
- (4) If the Trusted-and-Knowledgeable-Friend-or-Relative information source is chosen, then the search can be analyzed by whether the subject desires information regarding brand or store or both.

APPENDIX D-1

Two-source Sequences

Transition	Frequency	Transition	Frequency
1 4	3	5 3	1
1 6	1	5 4	9
2 1	2	5 6	4
2 3	1	5 7	2
2 4	17	5 8	1
2 5	9	6 1	2
2 6	4	6 2	1
2 7	7	6 3	1
3 2	1	6 4	18
3 4	4	6 5	3
3 5	1	6 7	6
3 7	1	6 8	2
3 8	1	7 2	22
4 1	1	7 3	3
4 2	4	7 4	18
4 3	1	7 5	3
4 5	7	7 6	10
4 6	15	7 8	4
4 7	9	8 4	5
4 8	4	6 6	2
5 1	1	8 7	1
5 2	6		

Number of subjects using at least 2 sources = 111

Total number of transitions = 235

APPENDIX B-2

Three-Source Sequences

Sequence	Frequency	Sequence	Frequency
1 4 8	1	5 6 4	4
1 6 2	1	5 6 7	1
2 1 4	2	5 6 8	1
2 3 4	1	5 7 2	2
2 4 1	1	5 7 4	1
2 4 5	1	5 8 4	2
2 4 6	2	6 2 4	1
2 4 7	1	6 2 5	1
2 5 4	5	6 3 4	1
2 5 6	2	6 4 2	1
2 5 8	1	6 4 5	1
2 6 4	4	6 4 6	2
2 7 2	1	6 5 1	1
2 7 3	1	6 5 3	1
2 7 4	4	6 7 2	1
2 7 7	1	6 7 4	2
3 4 5	1	6 7 8	1
3 5 7	1	6 8 4	1
4 3 7	1	6 8 7	1
4 5 2	1	7 2 1	1
4 5 4	2	7 2 3	1
4 5 6	2	7 2 4	9
4 6 4	2	7 2 5	3
4 6 5	1	7 2 6	3
4 6 6	1	7 2 7	3
4 6 7	3	7 3 2	1
4 6 8	1	7 3 8	1
4 7 2	1	7 4 5	1
4 7 4	2	7 4 6	2
4 7 6	3	7 4 7	1
4 7 8	1	7 4 8	1
4 8 4	1	7 5 2	1
5 2 1	1	7 5 4	1
5 2 4	2	7 5 6	1
5 2 7	2	7 6 4	4
5 4 2	1	7 6 5	1
5 4 4	1	7 8 6	2
5 4 5	1	7 8 4	1
5 4 6	1	8 4 6	1
5 4 7	1	8 6 4	1
5 4 8	2	8 6 5	1

Total cases exhibiting at least a 3-source transition = 67.

Total number of 3-sequence transitions = 132

APPENDIX B-3

Four-Source Sequences

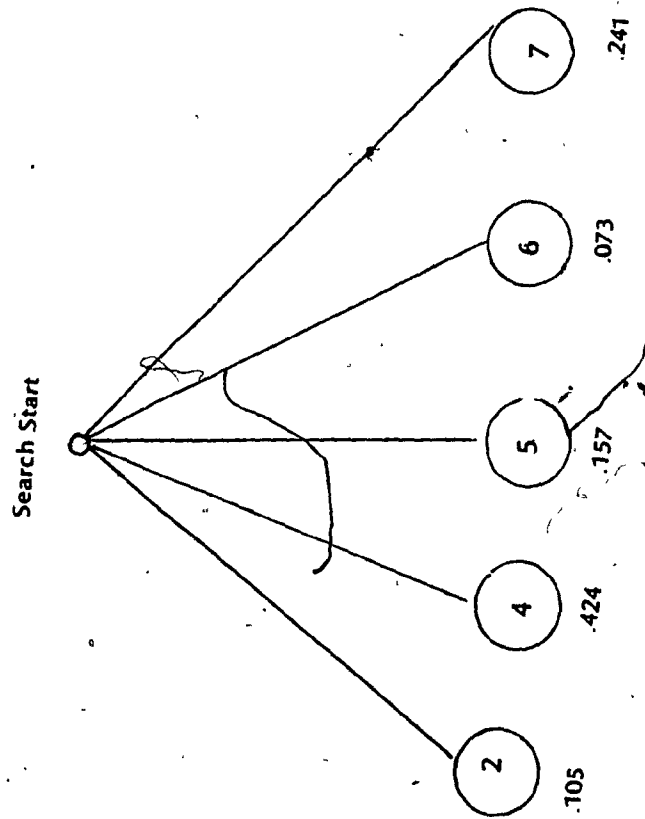
Sequence	Frequency	Sequence	Frequency
7 2 4 1	1	5 8 4 6	1
4 7 8 6	1	7 2 5 6	1
7 8 6 5	1	2 5 6 4	1
8 6 5 3	1	5 4 7 4	1
5 2 7 4	2	7 2 3 4	1
2 7 4 8	1	2 3 4 5	1
7 8 6 4	1	3 4 5 6	1
8 6 4 6	1	2 7 4 7	1
7 2 7 3	1	7 4 7 2	1
2 7 3 2	1	7 2 7 2	1
2 4 6 7	1	2 7 2 7	1
2 4 7 6	1	7 2 7 4	1
7 2 5 4	1	2 7 4 6	1
2 5 4 8	1	7 4 6 6	1
5 4 8 4	1	7 5 2 1	1
5 7 2 4	1	5 2 1 4	1
7 6 4 5	1	2 1 4 8	1
6 4 5 2	1	7 2 4 6	1
5 7 2 1	1	2 4 6 4	1
7 2 1 4	1	5 6 7 4	1
1 6 2 4	1	6 2 5 8	1
6 2 4 5	1	2 5 8 4	1
2 4 5 4	1	5 8 4 4	1
4 5 4 6	1	7 4 5 4	1
4 6 8 7	1	4 5 4 8	1
7 2 6 4	3	2 5 4 5	1
4 6 7 8	1	7 4 6 5	1
7 6 4 2	1	4 6 5 1	1
2 5 6 8	1	6 4 6 4	1
5 6 8 4	1	3 5 7 4	1

Total cases exhibiting at least a 4-source transition = 35.

Total number of 4-sequence transitions = 63

Appendix C-1

Most Probable First Information Source Used

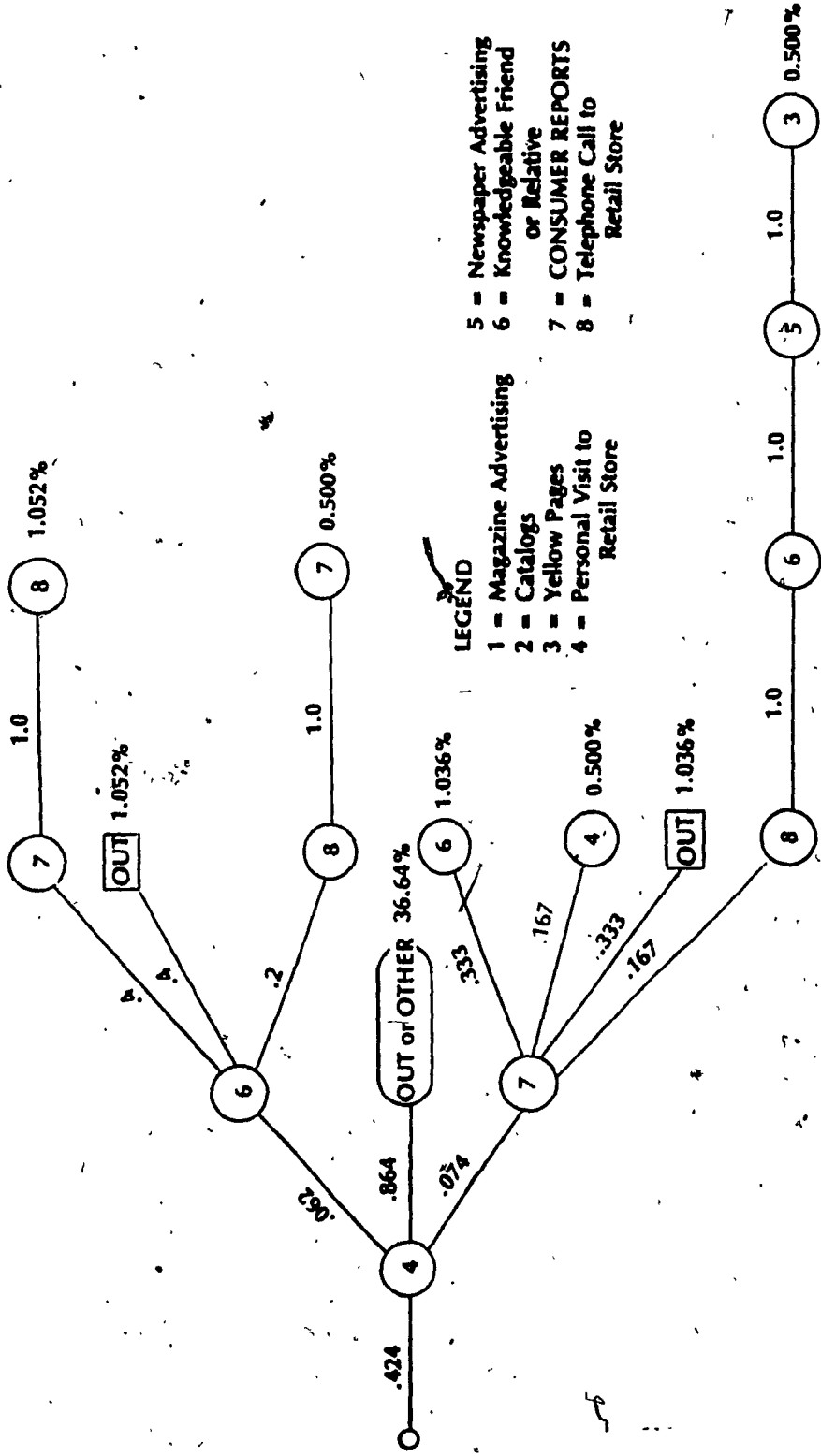


LEGEND

- 1 - Magazine Advertising
- 2 - Catalogs
- 3 - Yellow Pages
- 4 - Personal Visit to Retail Store
- 5 - Newspaper Advertising
- 6 - Knowledgeable Friend or Relative
- 7 - CONSUMER REPORTS
- 8 - Telephone Call to Retail Store

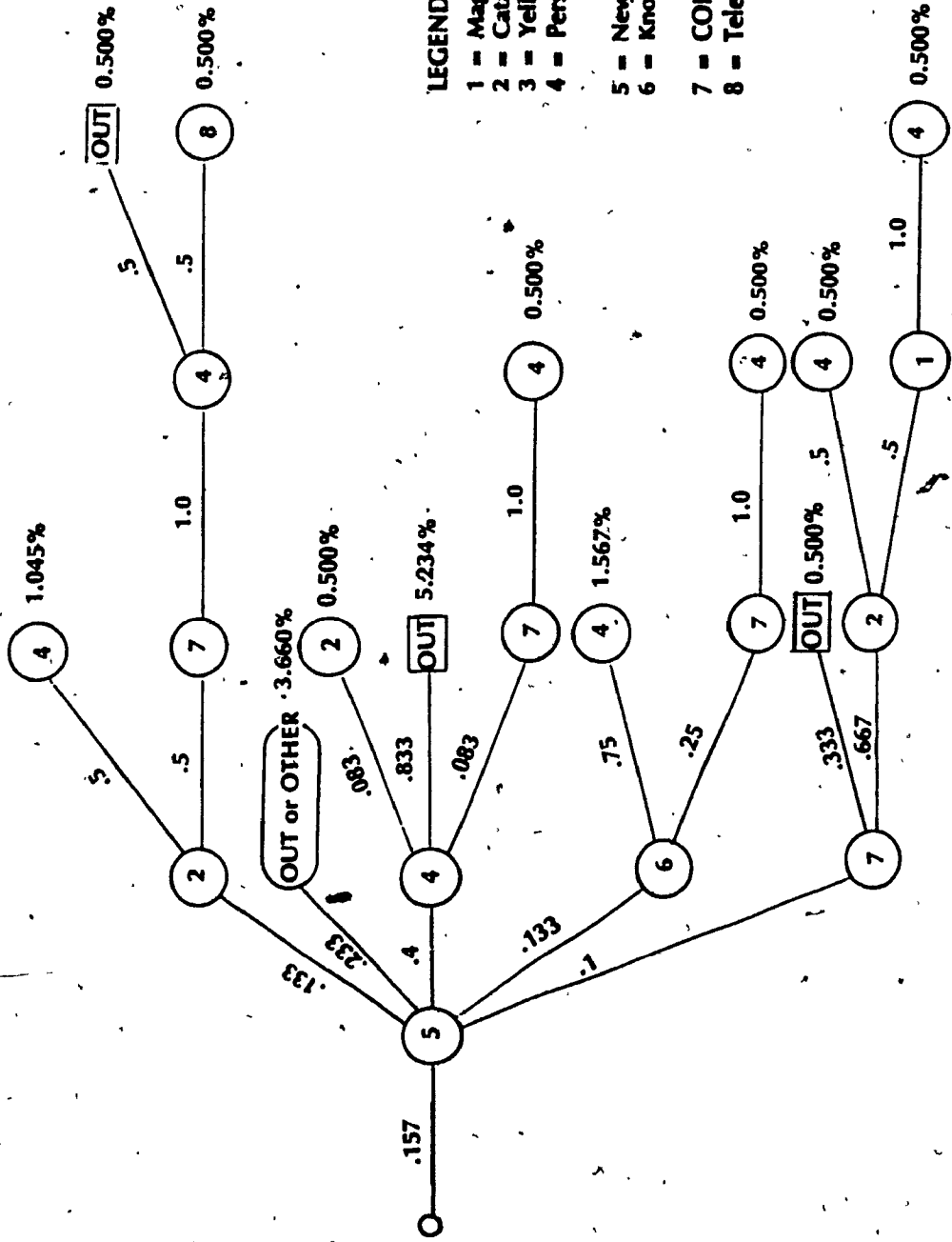
Appendix C-2

Information Search Paths Beginning with Use of Personal Visit to Retail Store



Appendix C-3

Information Search Paths Beginning with Use of Newspaper Advertising



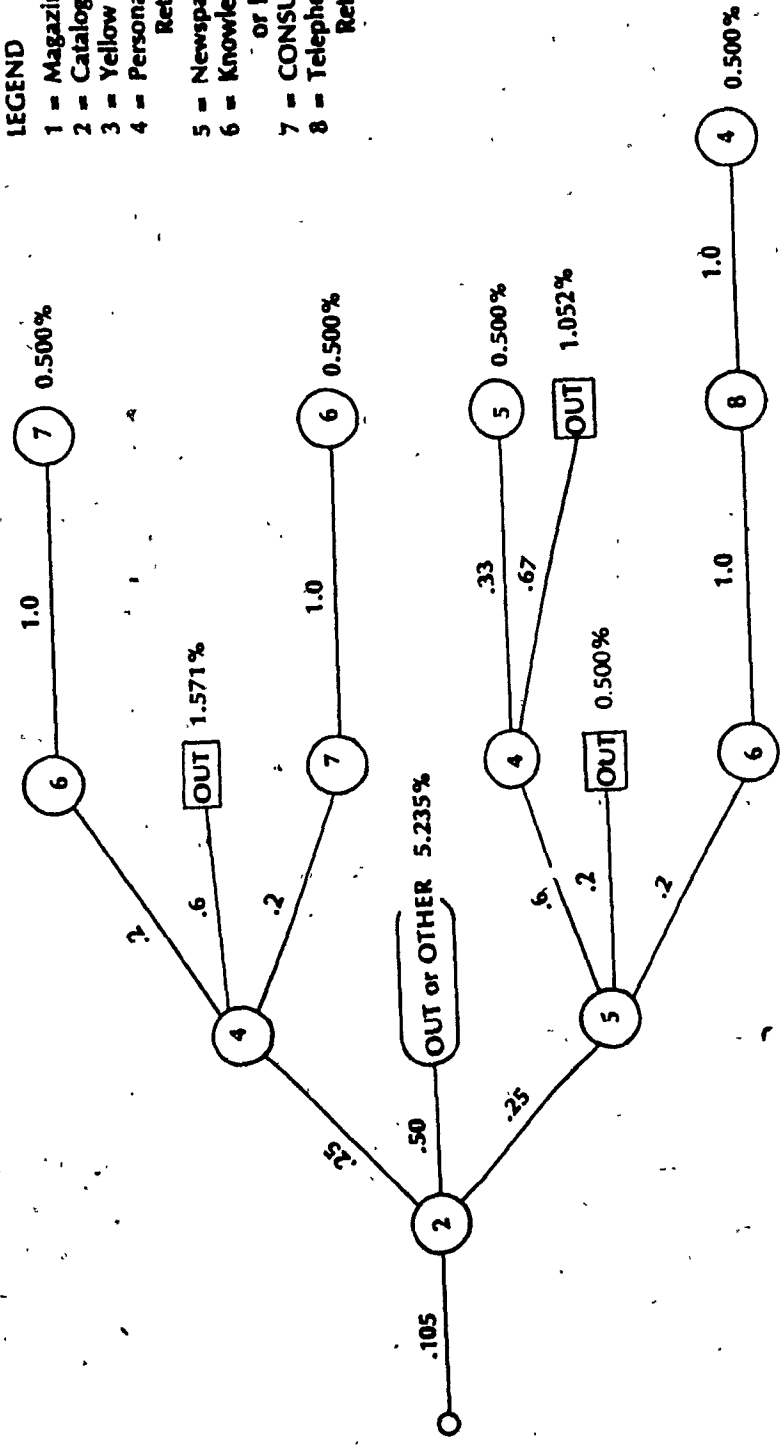
LEGEND

- 1 = Magazine Advertising
- 2 = Catalogs
- 3 = Yellow Pages
- 4 = Personal Visit to Retail Store
- 5 = Newspaper Advertising
- 6 = Newspaper Advertising or Knowledgeable Friend or Relative
- 7 = CONSUMER REPORTS
- 8 = Telephone Call to Retail Store

Appendix C-4

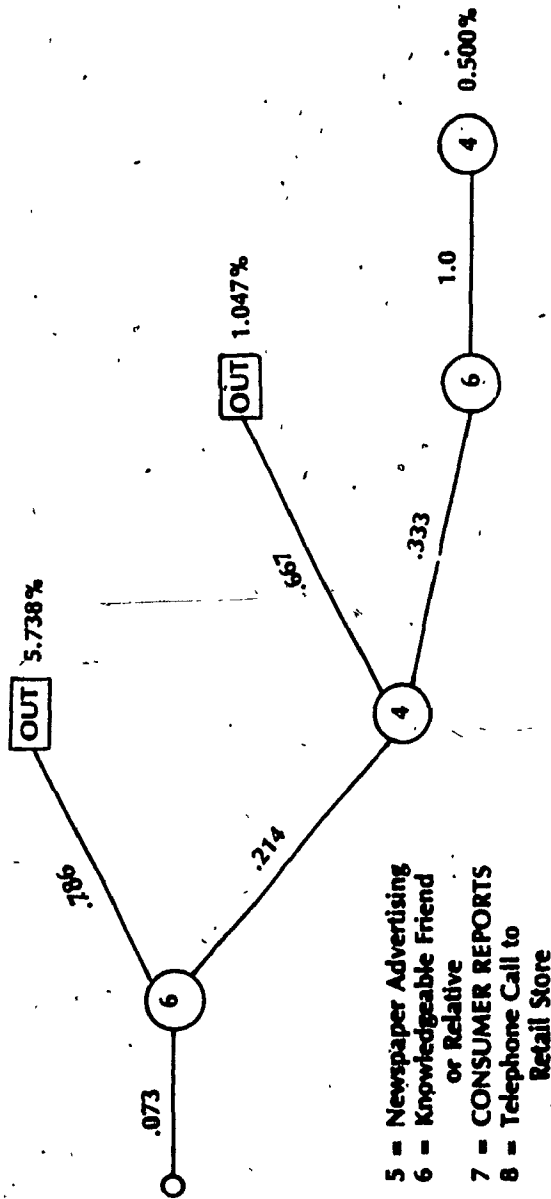
Information Search Paths Beginning with Use of Catalogs

- LEGEND**
- 1 = Magazine Advertising
 - 2 = Catalogs
 - 3 = Yellow Pages
 - 4 = Personal Visit to Retail Store
 - 5 = Newspaper Advertising
 - 6 = Knowledgeable Friend or Relative
 - 7 = CONSUMER REPORTS
 - 8 = Telephone Call to Retail Store



Appendix C-5

Information Search Paths Beginning with Use of Knowledgeable Friend or Relative



- LEGEND**
- 1 = Magazine Advertising
 - 2 = Catalogs
 - 3 = Yellow Pages
 - 4 = Personal Visit to Retail Store
 - 5 = Newspaper Advertising
 - 6 = Knowledgeable Friend or Relative
 - 7 = CONSUMER REPORTS
 - 8 = Telephone Call to Retail Store

Appendix C-6
 Information Search Paths Beginning with Use of Consumer Reports Magazine

