INVESTIGATING DIFFERENCES IN SEARCH BEHAVIOR:

IN-STORE, E-COMMERCE and M-COMMERCE

by

MOUTUSI MAITY

(Under the Direction of George M. Zinkhan)

ABSTRACT

Information search behavior (and decision making) is the focus of this dissertation. To this end, our goal is two-fold: a) explore the various antecedent variables to information search and measure the corresponding effect sizes; b) compare and contrast consumer information search behavior in three different *modes of search* (i.e., the medium in which information search is undertaken) – *in-store*, *e-commerce* and *m-commerce*.

As a method for summarizing extant traditional search literature, we conduct a meta-analysis, with *information search* (i.e., "total amount of search" in traditional channels) as the dependent variable. 81 antecedent variables are uncovered from 65 studies, and the meta-analysis is carried out on 44 variables, 37 of which show significant effect size(s). Moderator analysis suggests that *age*, *gender*, *product type* and *income* are the most significant moderators of consumer information search.

Next, two laboratory experiments are conducted with *information search*, *evaluation of alternatives*, *purchase/decision* and *post purchase behavior* (variously operationalized) as dependent variables. The first experiment is a 3x3 between subjects design (usable sample size 162), where each factor has three levels. *Mode of search* (the levels are *in-store*, *e-commerce*, *m-*

commerce) is the first factor, and *task type* (simple → complex), is the second factor. The second experiment is a 2x3 mixed design (usable sample size 31), where *mode of search* is the within factor and *task type* is the between factor. The second experiment replicates the results of the first one. Competing predictions are made and different hypotheses are tested based on different theoretical frameworks (e.g., cost-benefit framework, categorization theory, media-richness theory). Our findings suggest that the amount of information searched in the different modes, follows the predictions made by cost theory (i.e., an inverted U-shaped curve). Lesser amount of search is undertaken in the most rich medium (i.e., in-store), while it increases as one moves on to e-commerce. However, it is the least in m-commerce (i.e., least rich medium). Further, "task-mode fit" is perceived, supporting the hypothesis that certain modes are more suitable for specific tasks than other modes.

INDEX WORDS: Information search, Decision making, Choice processes, Mobile commerce, E-commerce, Meta analysis, Experiment, Cost theory, Categorization theory, Task-Technology fit, Task-Media fit, Media richness, Consumer behavior, Marketing

INVESTIGATING DIFFERENCES IN SEARCH BEHAVIOR: IN-STORE, E-COMMERCE and M-COMMERCE

by

MOUTUSI MAITY

B.A., University of Calcutta, India, 1995

M.A., Jadavpur University, India, 1997

M.B.A., University of Calcutta, India, 1999

A dissertation Submitted to the Graduate Faculty of The University of Georgia in Partial Fulfillment of the Requirements for the Degree

DOCTOR OF PHILOSOPHY

ATHENS, GEORGIA

2005

INVESTIGATING DIFFERENCES IN SEARCH BEHAVIOR:

IN-STORE, E-COMMERCE and M-COMMERCE

by

MOUTUSI MAITY

Major Professor: George M. Zinkhan

Committee: Srinivas K. Reddy
Scott Shamp

Electronic Version Approved:

Maureen Grasso
Dean of the Graduate School
The University of Georgia
August 2005

to Ma

ACKNOWLEDGEMENTS

This work could never have been accomplished without the ever-encouraging support of those I am honored to know and work with. I would like to thank my dissertation committee members for all their insights, guidance and generous help. Special thanks go to my committee chair, Dr. George M. Zinkhan, who revealed all the excitement of doing solid research and whose relentless pursuit for perfection made it an enlightening journey. Srinivas K. Reddy, whose admirable expertise and wisdom challenge me in his ever-inspiring way. Scott Shamp, who so generously gave me all kinds of invaluable support to grow as a starting researcher. You are the best mentors I could possibly ask for.

I am deeply indebted to the faculty members in the department, Drs. Kimberly Grantham, Peggy Emmelhainz, Chris Plouffe and Kevin Ellis who so generously helped me in my data collection endeavors. I would like to express my gratitude to Drs. Warren French, Richard Fox and Thomas W. Leigh for graciously agreeing to serve on my oral comprehensive examination committee. I am also grateful to the other faculty members in the department, Drs. Rajiv Grover, Ellen Day, Melvin Crask, Barbara Carroll, Roberto Friedmann and Vanessa Patrick, for their unconditional encouragement and support.

My heartfelt thanks go to the New Media Institute (NMI) at the University of Georgia for providing me with extensive technical support. I owe a special thank you to Mayukh Dass, who helped me develop the experiment stimulus. I also thank Jason Zhang and Graham Austin, who offered me great help during my data collection process. Without you, this research would never have been completed.

I would like to acknowledge the support of all my current and previous fellow doctoral students. Thank you for your friendship. And, of course, Connie Autry and Sandra Doolittle, who has always been so supportive and generous with her time!

TABLE OF CONTENTS

Page

LIST OF TABLES

[1] K = Number of studies in which a particular antecedent variable occurs

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

"Search Behavior" is a key aspect of human life. Thus, it is of no surprise that marketing researchers are interested to understand search strategies that are employed in the marketplace. Studies looking at information acquisition and search strategies began appearing as early as the 1950s. Several studies have specifically concentrated on how pre-purchase information is gathered by consumers (Newman and Staelin 1972). Key issues in this area include: dimensions of consumer expertise (e.g., Alba and Hutchinson 1987), individual search strategies (e.g., Furse, Punj and Stewart 1984) and search effort (Newman and Staelin 1972; Beaty and Smith 1987; Srinivasan and Ratchford 1991). Most studies have explored search behavior in traditional retail channels, i.e., the off-line environment. Consumer information search has been the focus of numerous articles in the consumer behavior, economics, and marketing literature over the past three decades (e.g., Beatty and Smith 1987; Furse, Punj and Stewart 1984; Moorthy, Ratchford and Talukdar 1997; Newman 1977; Punj and Staelin 1983; Ratchford, Lee and Talukdar 2003; Srinivasan and Ratchford 1991; Wilkie and Dickson 1985).

Information search has been explored from various perspectives. Table 1 documents some of the variables that have been studied. For example, external search behavior of consumers in traditional retail channels, has been extensively studied and modeled (Biehal and Chakravarti 1982; Punj and Staelin 1983; Srinivasan and Ratchford 1991). Some key factors that influence search strategies are: knowledge and experience (Punj and Staelin 1983;

Table 1: Information Search Literature: Various Perspectives

Categories	Representative Articles	Theory
Overall Search		
Internal Search	Biehal and Chakravarti 1986	Cost Theory (Stigler 1961)
External Search	Newman and Staelin 1971	Cost Theory (Stigler 1961)
Context Variables		
Offline environment	Jacoby, et al. 1974 Malhotra 1984	All the theories mentioned in the table
Online environment	Moe and Fader	All the theories mentioned in the table
Person Variables		
Prior knowledge Information processing abilities Ability to search Motivation to search Involvement Satisfaction Perceived risk Cost of search	Brucks 1985 Alba and Hutchinson 1987 Garener 1984 Park and Lessig 1981 Russo and Johnson 1980 Staelin 1978 Newman and Staelin 1971, 1972 Zaichkowsky 1987	Theory of Individual Difference
Memory		
Long-Term Memory	Herr 1989 Anderson 1990 Hansen 1981 Meyers-Levy 1989 Rothschild and Hyun 1990	
Working Memory: E.g.,	Biehal and Chakravarti 1982, 1983 Bettman, Johnson and Payne 1991	Depth of processing theory (Craik and Lockhart 1972)

Categories	Representative Articles	Theory
Choice Process Information Overload Heuristics	Lynch and Srull 1982 Jacoby, Speller and Berning 1974 Wright 1974 Scammon 1977 Malhotra 198 Newell and Simon 1981 Alba and Marmorstein 1987 Biehal and Chakravarti 1986 Bettman and Zins 1979	 Theory of short-term memory (Broadbent 1958) Satisficing theory (Simon 1974) Cost Theory (Stigler 1961)
Task Variables		
E.g., Types Number of alternatives and attributes Time allowed/time pressure Formats Task complexity	 Rothschild and Hyun 1990 Punj and Staelin (1983) Jacoby, et al. 1974 Malhotra 1984	 Cost Theory (Stigler 1961) Utility theory Categorization Theory

Srinivasan and Rartchford 1991), cost and benefits associated with search (Johnson and Russo 1984; Punj and Stewart 1983), risk and the importance of the product (Laurent and Kapferer 1985; Chaudhuri 2000), information format and choice tasks (Biehal and Chakravarti 1982). It is now widely recognized that both online and offline realms can and do serve as rich and relevant sources of information.

Search behavior is the focus of this dissertation. Major objective is to explore "goal directed" consumer information search behavior. As is apparent from the previous discussion, it would be extremely challenging to try and consider all relevant variables in a single study. Hence, our approach is to consider separate aspects of search through three distinct studies (a meta-analysis and two experiments). The main dependent variable is "information search". The studies in this report are presented in two parts. In the first part, an attempt is made to summarize extant search literature in the offline environment. In the second part, search behavior is monitored in online and offline environments. We concentrate on "goal-directed" pre-purchase search behavior. Two[2] laboratory experiments are undertaken to help us compare and contrast search behavior in the two environments. The specific objectives associated with the two parts are discussed in subsequent sections.

META-ANALYSIS on INFORMATION SEARCH in the OFFLINE ENVIRONMENT

The first study, presented in Chapter 2, is designed to integrate and summarize the previous work done in the traditional (offline) information search area. Our literature search yield 370 studies that broadly investigate information search (offline). We conduct a meta-analysis, with information search (*offline* only) as the dependent variable. We consider only those cases where information search is operationalized as: 1) Total amount of search (defined

[2] One between subjects design experiment (sample size 162), and another mixed design experiment (sample size 31)

as: number of alternatives/brands taken into consideration, number of attributes considered, the number of times a particular source is examined *or* the extent of search), and 2) Time spent on search. These two are the most widely used and accepted measures that are used to operationalize information search (Kent 2003). 65 of the 370 studies found are included in the meta-analysis.

Built upon the findings of this meta-analysis, we create one baseline model that includes variables from a traditional (i.e., offline) information search perspective. We introduce a second model that addresses search behavior in the online environment. Specific objectives associated with chapter 2 are :

a) To identify specific antecedents of information search from extant literature.
b) To assign the antecedents into broader clusters. Sharon and Beatty (1987) suggest seven categories of variables. We are interested to find out if these are the only categories represented in marketing literature. For instance, are there other categories that have not been formally recognized?
c) To identify competing theories and perspectives.
d) To suggest competing models.

To what extent can we draw an analogy between online information behavior with its offline counterpart? To what extent is online information search a unique phenomenon? The model that emerges from the meta-analysis (for offline information search), along with the second model designed (specifically for online search) will make progress forward answering the questions raised here. A meta-analysis technique is used to assess effect sizes, the distribution and central tendencies for various correlates of information search (e.g., prior knowledge, perceived risk, number of alternatives). The meta-analysis is based on a critical review of the

findings of 65 published and unpublished studies that summarize the empirical work in traditional (offline) information search literature area prior to 2003[3].

TWO[4] LAB EXPERIMENTS

Background and Statement of Purpose

Consumers frequently collect information through various search modes (e.g., in-store, Internet). For instance, advances in technology (especially with respect to networks) have made it possible for consumers to search for information over the Internet. Moreover, new devices (e.g., cell phones, palm digital assistants) are being used which open up possibilities for new modes of search (in this case, "mobile commerce" or m-commerce[5]). "Mode of search" is defined as the medium in which consumers undertake information search (e.g., in-store, Internet – e-commerce, m-commerce). The majority of past research regarding pre-purchase search has usually concentrated on exploring consumer search in one mode (i.e., in one medium). We argue that it would be interesting to study the search processes in different modes.

Two laboratory experiments are undertaken in chapter 3. The second experiment designed is a small study, which seeks to replicated the findings of the first experiment. In the experiments, we are interested in exploring different modes in which consumers undertake search: specifically in-store, e-commerce and m-commerce. We base our identification of the modes of search on media richness theory, propose a framework for modes of search and describe why we select these specific modes for further exploration.

---

[3] The meta-analysis is an ongoing process and we are in the process of collecting studies after 2003, though these are not included in this report.

[4] One between subjects design experiment (sample size 162), and another mixed design experiment (sample size 31)

[5] M-commerce is "mobile commerce" – as e-commerce is "electronic commerce". Mobile commerce involves the use of devices that enable consumers to communicate or undertake transactions even when they are not anchored to a specific location.

Communication channels are conceptualized as possessing a set of objective characteristics that determine each channel's capacity to carry "rich" information. Communication media differ in the richness of information processed. This is based on feed-back capability, language variety and personal focus of the communications channel utilized. The more a medium incorporates these elements, the richer it is. Media Richness Theory (MRT) (Daft and Lengel 1984, 1986; Daft, et al. 1987) suggests that rich media allow communication of complex and difficult issues while the communication of routine activities are best carried out in lean media. McGrath and Hollingshead (1993) classify media for communication along a continuum of "increasing potential richness of information". The four types of media that are identified by MRT are: *text* (computer systems), *audio systems*, *video systems* and *face-to-face* communications. According to MRT, Face-to-face is considered the richest medium as it allows mutual feedback and simultaneously conveys a variety of cues (e.g., tone, facial expression, emotion). Text is considered the least rich.

Our framework for the modes of search (see Tables 2 and 3) is conceptually based on the media richness theory. However, we define our framework in terms of two dimensions: a) "increasing potential richness of information" (from MRT), and b) "interactivity" (Alba, et al. 1997) of the mode ("interactivity" is similar to feed-back capability and is suggested by media richness theory). The different types of modes of search are identified in Table 2.

Drawing from MRT (i.e., taking into account the feed-back capability, language variety and personal focus of the communications channel utilized), it is argued that more interactive modes are more rich than modes that are not interactive, hence they are richer media of communication. The identified modes of search can, therefore, be further aligned along a continuum of "increasing potential richness of information for Decision-Making" (Table 3).

Table 2: Framework For Modes of Search

	Increasing Potential Richness of Information →			
	Text	**Audio**	**Video**	**Face-to-face**
Interactive	*Internet* ∗ *(M-Commerce; E-Commerce)*	Telephone	Home Shopping Network	*In-Store* ∗
Not interactive	Catalog/ Printed Material	Radio	TV	(NA) Face-to-face assumes interactivity

Table 3: Modes of Search

Increasing Potential Richness of Information for Decision-Making →							
Catalog/Printed Material	Radio	TV	Telephone	Home Shopping Network	M – Commerce (Wireless PDA) ∗	E – Commerce ∗	In-Store∗

∗ Explored in the experiments

Therefore, according to our framework, catalog search is the least "rich" mode of search, while in-store search is the most "rich" mode of search, with radio, TV, telephone, home shopping network, m-commerce and e-commerce occurring along the continuum, with the richness of the media increasing as one moves along the continuum.

In the experiments, we concentrate only on "goal-directed search" (as opposed to "ongoing search"), defined as a search in which the consumer is looking for specific information from the sources consulted. Therefore, the modes of search that we choose to explore in the experiments (e.g., in-store, e-commerce and m-commerce) are determined from the proposed framework in the following manner:

- Channels where consumers actively search for information
- Channels where consumers search for information in person
- Channels where consumers search for specific information (where information search is not incidental – i.e., where one does not come upon the information incidentally) – i.e., search is "goal directed" and not "ongoing" in nature

Some modes of search (e.g., radio, TV) are not appropriate for investigation here, as most of the information obtained from these modes contribute to ongoing search. Catalog and telephone search are not very widely undertaken and hence a study will not substantially add to our knowledge. Hence, we empirically study the following modes:

a) In-store (face-to-face/interactive)

b) E-Commerce (text/interactive)

c) M-Commerce (text/interactive)

Specific objectives associated with chapter 3 are:

a) To propose a framework for modes of search.

b) To understand process differences under 3 different search modes.

c) To explore the roles of both memory-based *and* stimulus-based searches in the different modes of search.

d) To test three theories (cost-benefit theory, categorization theory and media richness theory and task-media fit) on search behavior.

The Experiments

The experiments empirically explore the potential influence of two factors (*Mode of Search* and *Task Type*) on consumers' search for information. The first experiment is a between-subjects design, while the second is a mixed-subjects design. The classical buyer decision-making process consists of: **problem recognition, information search, evaluation of alternatives, purchase decision** and **post-purchase behavior** (Howard and Sheth 1972; Engel, Kollat and Blackwell 1973; Nicosia 1982). The dependent variables in the two experiments and their interrelations with each other are represented in Figure 1.

The dependent variables have been chosen to represent last 4 stages of information search: **information search, evaluation of alternatives, purchase decision** and **post-purchase behavior**. The first stage of **problem recognition** is incorporated through the presentation of the stimuli to participants. Specifically, the dependent variables for the lab experiment are:

a) **Information search** is measured through: 1) Total Amount of Search, measured as the number of times a particular information is accessed and as extent of search (the sequence in which the information is accessed will also be tracked, which will give the pattern of search); 2) Time Spent on Search;

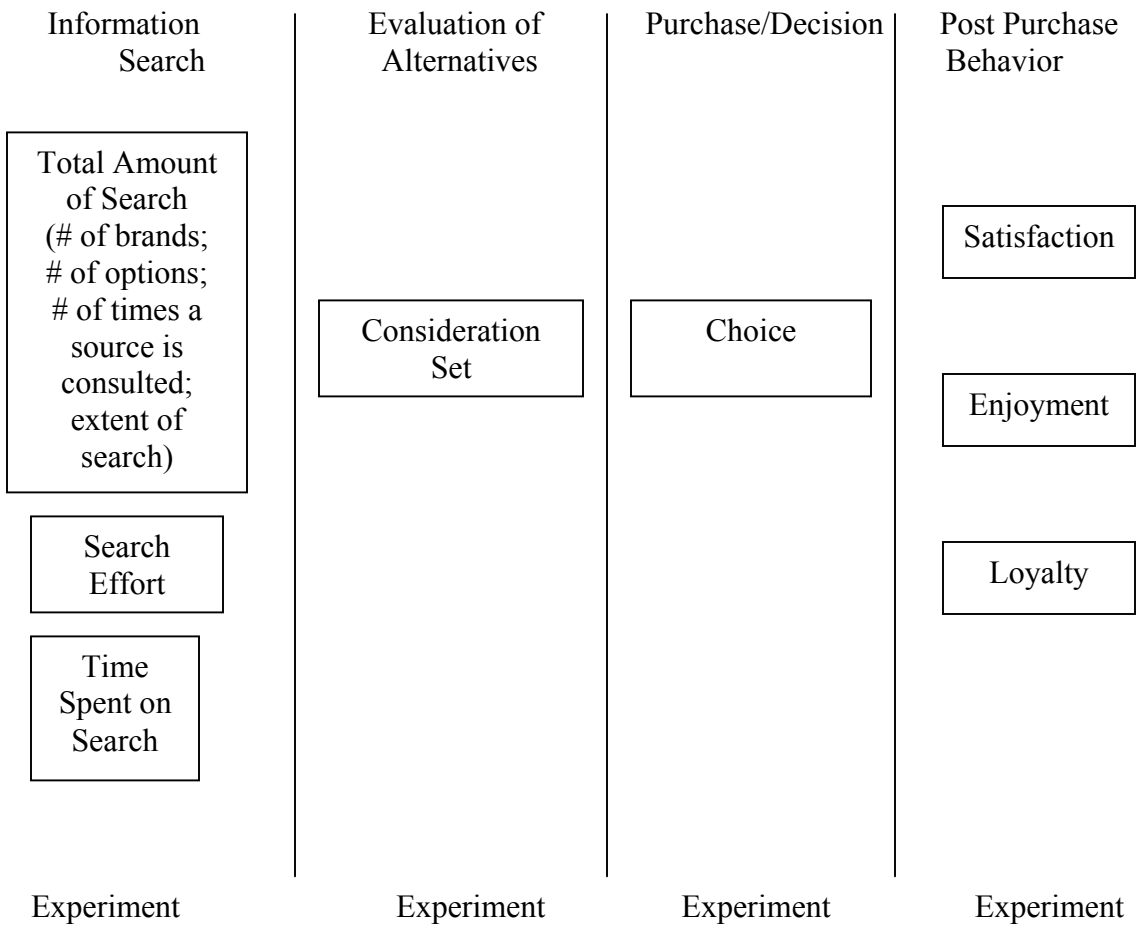


Figure 1: Dependent Variables in the Experiments

b) **Evaluation of alternatives** is measured through: 3) Consideration Set;

c) **Purchase/Decision** is captured through: 4) Decision Making and Simulated Purchase;

d) **Post-purchase behavior** is represented by: 5) Satisfaction; 6) Enjoyment; 7) Perceived Effort, and 8) Loyalty.

The experiments are designed to test several hypotheses related to: a) **mode of search** (e.g., in-store, e-commerce, m-commerce) and b) **task type** (e.g., simple→complex; three levels of complexity are incorporated) on information search behavior. In the first experiment, both factors are between-measures factors. However, in the second experiment, mode of search is a with-in factor, while task type is a between measures factor. Hypotheses on interactions between the factors are also tested. **Format of information presentation** is one control variable for both the experiments. The covariates in the experiments are **perceived risk**, **perceived cost**, **prior experience**, **tolerance for ambiguity** (Budner 1962), **demographic variable** (e.g., income) (e.g., Engel, et al. 1978; Claxton, et al. 1974; Newman and Staelin 1972), **need-for-cognitive clarity** (Cox 1967), and **information seeking self efficacy** (Provost 2004) and **price sensitivity** (Goldsmith 1996). These individual difference variables have been found to effect information search and processing. 173 student subjects are recruited for experiment 1, while 37 of those who participated in experiment 1 signed up for experiment 2 as well. A third study ("natural search[6]") is undertaken to learn more about what *mode of search* a consumer is likely to choose when faced with a decision task.

---

[6] Formally, in the two experiments, three levels (in-store, e-commerce and m-commerce) of the factor "search mode" are explored. "Natural search" is included as a separate study, where participants are presented with one search task at a time and are instructed to choose any one of the three search modes (as described above) that they wish to carry out the search task in. This process is repeated with all search tasks. This study (separate from the two experiments) is included mainly to explore the processes adopted by consumers when they are presented with a search task that has to be undertaken, but the decision about the mode has not been made.

The greater risk reflected in decision tasks with higher levels of difficulty influences the types of information sources that consumers seek (Locander and Hermann 1979). Hence, we hypothesize that participants will choose to undertake certain search tasks usually on certain modes, i.e., task-media fit exists.

Cost–benefit theory (Stigler 1961) and Categorization theory (Mervis and Rosch 1981) have often been used in the context of information search (Table 1). Task-media fit (based on media richness theory) has not been applied to a search context to investigate whether a "fit" exists between a task type and a mode (*media*) of search. A set of hypotheses is designed to test these theories. Specifically ***cost-benefit theory***, ***categorization theory***, ***media richness theory (MRT)*** and ***task-media fit (TMF)*** are tested. Contrasting predictions are made on **total amount of search**, **time spent on search**, **consideration set**, and **decision making**. Some example hypotheses are as follows:

Cost theory predicts: Decrease in media richness → Increase in cost of search → Inverted-U shaped curve for total information search (Inverted-U). In other words, as the richness of the media decreases, cost of search increases. When the richness of the medium is the highest, the cost of search is the lowest. According to cost theory, the amount of information search undertaken is low. As the cost of search increases, the amount of information search undertaken increases (till benefits outweigh costs). After the point where benefits outweigh costs, the amount of information search undertaken decreases. Therefore, an inverted U-shaped curve is predicted as per cost theory.

> H1(a): As the media richness of the mode decreases, the costs of search increase. As a result the total information search undertaken follows an inverted U-shaped curve.

Categorization theory predicts that a decrease in media richness leads to an increase in perceived risk, which leads to an increase in total information search (+). In other words, as the richness of the media decreases, the perceived risk associated with the media increases. Categorization theory suggests that the overall perception that a consumer has for a product category is transferred on to a specific product in that category (Mervis and Rosch 1981). In the context of retail literature and hence, mode of search, categorization theory predicts that the

general attitude an individual holds towards a particular mode of search is likely to affect the consumers' perceptions and attitudes towards specific stores in that mode of search (Bauer and Greyser 1968; Darley and Lim 1993; MacKenzie and Lutz 1989). Therefore, when the richness of the medium is the highest, the perceived risk associated with it is the lowest. According to categorization theory, the amount of information search undertaken is low. As the perceived risk increases, the amount of information search undertaken increases. Therefore, an increasing curve is predicted as per categorization theory.

> H1(b): As the media richness of a mode decreases, the perceived risk associated with the search modes increases, leading to an increase in the total information search undertaken.

McGrath and Hollongshead (1993) suggest TMF as a modification of MRT, hypothesizing that a "fit" occurs when the information richness requirements of the task assigned and the information richness capabilities of the communication medium align (Suh 1998). Therefore, the task-media fit hypothesis suggests that a search mode that fits the characteristics of a search task better than another search mode will result in a better performance on the search task. Similar sets of predictions are made about **satisfaction**, **enjoyment**, **perceived effort** and **loyalty**. For example, the theory predicts that, when an ideal fit is **not** achieved, a richer medium is better suited for decision-making than a less rich medium. Thus, an example hypothesis from this theory is stated as:

> H8: An over-fit between search task and mode of search will lead to higher individual enjoyment than under-fit.

CONTRIBUTIONS TO KNOWLEDGE

Managerial Implications

In the 21st century, consumers search for information through various modes (e.g., in-store, Internet (Fixed), Internet (Mobile)). The two experiments give a better understanding of

search in the various environments. For instance, to what extent does one search mode substitute or complement another? Why are some search tasks conducted on the Internet and others are conducted in the offline environment? What shapes consumer preferences for searching on a particular mode?

The answers to such questions have implications for communications, strategy, advertising and media selection. If managers have a better understanding of how the different search modes are used by consumers, then they will be in a stronger position to organize information in these different environments. For example, insights will be gained about what kinds of information should be presented on a Website for e-commerce and m-commerce. What kinds of information should be provided on Websites and what kinds of information should be located elsewhere?

Theoretical Contributions

The three studies (one meta-analysis and two experiments) reported here, though separate, are linked through common dependent variables: total amount of information search *and* time spent on search. The meta-analysis is the first of its kind in the information search literature. No study to date has made a systematic attempt to uncover the antecedents (and the associated effect sizes) of information search. The theoretical models contribute to the debate on whether the Internet is a unique mode of providing information, or, in contrast, is an extension of traditional information search modes. Is human behavior in cyberspace simply an extension of offline behavior? Or, do we need new methods and theories to understand human interactions on the Internet? By contrasting theories (e.g., cost-benefit theory, categorization theory) and, by presenting competing models, we provide a test for explaining patterns in consumers' online information search behavior. We propose a framework for modes of search. Extant literature

proposes frameworks for sources of information, but there is no widely used framework for modes of search.

The question of task-media fit has not yet been explored in the marketing literature. MRT and Task-media fit argues that if the capabilities of a particular medium supports the accomplishing of a certain communication task, it will result in a better performance of that particular task. Here, we extend the theory of task-media fit, as developed in the media literature, to the problem of information search behavior and suggest that if a particular mode of search supports the accomplishing of a certain search task, it will also result in a better performance of the search task.

Cost-benefit theory proposes that consumers screen alternatives to form consideration sets and that diminishing returns set in after a certain point, while Categorization theory suggests that more search will be conducted as perceived risk increases. The two experiments explore the extent to which internal and external search varies across different modes. For instance, the reliance on memory-based search is compared to stimulus-based search (which might be a function of the search mode).

New media (e.g., Internet, cell phone, palm digital pilot) possess characteristics that might affect consumer information search behavior patterns. An exploration of different media address important managerial and theoretical questions. The exploration of these theoretical questions add to a body of literature that contributes towards the continuing investigation and understanding of consumer information search behavior. Specifically, our contributions are in the area of information search in the contexts of emerging media and changing technological environment. Similarly, the managerial questions have implications for the new media.

GENERAL ORGANIZATION OF THE REPORT

The first study (presented in chapter 2), is a meta-analysis, designed to integrate and summarize the previous empirical work. This study also puts forth two baseline models (i.e., for the offline environment) and one competing model (i.e., for the online environment). The second study (presented in chapter 3), consists of two experiments, designed to explore the potential influence of two main factors (*mode of search* and *task type*). The last chapter (chapter 4) presents an integration of the two studies. An integrated reference list is presented at the end of the last chapter.

CHAPTER 2

META-ANALYSIS ON INFORMATION SEARCH BEHAVIOR IN THE OFFLINE ENVIRONMENT

Marketing literature is replete with studies involving the phenomenon of information search. The topic of information search has been regularly investigated since the early 1950's. However, very few studies have attempted to document the antecedents that appear in the context of information search and none have attempted to conduct a meta-analysis with information search as the dependent variable. In this study, address these two issues. Hence, we endeavor to document systematically the variables that have been used in empirical studies as antecedents of information search (in the offline environment only) and to conduct a meta-analysis where the dependent variable is information search (offline only). The specific objectives associated with this study are:

a) To identify specific antecedents of information search from extant literature; *and* to study the strengths and the directions of the relationships that these variables display (with information search as the dependent variable).
b) Undertake moderator analyses to uncover some of the important moderators.
c) Attempt to assign the antecedents that are uncovered into broader clusters. Sharon and Beatty (1987) suggest seven categories of variables that have been investigated in the context of information search. We are specifically interested in finding out if these

are the only categories represented in the information search literature *or* whether there are other categories that have not been formally recognized.

d) Uncover competing theories through the meta-analysis.

e) Attempt to provide answers to questions like: To what extent can we draw an analogy between online information behavior with its offline counterpart? To what extent is online information search a unique phenomenon? One model come out of the meta-analysis (on offline information search), and a second model (specifically on online search) is proposed to identify antecedent variables for online search. These help us obtain answers to the questions raised here.

ANTECEDENTS OF INFORMATION SEARCH: THEORETICAL FOUNDATIONS

In a review of the traditional (offline) information search literature, Beatty and Smith (1987) (Table 4) list seven categories of variables that affect information search. These seven include: 1) market environment, 2) situational variables, 3) potential payoff, 4) knowledge and experience, 5) individual differences, 6) conflict and conflict resolution and 7) cost of search.

Additionally, the authors list 60 variables that have been empirically studied as determinants of information search. However, it is almost two decades since this study appeared in the *Journal of Consumer Research*. Moreover, many other studies investigating consumer search behavior have appeared since and a lot has changed regarding the way in consumers undertake information search now. For example, new modes of search – like the Internet and mobile technology – are now at the disposal of consumers. Therefore, other variables that had not been previously studied might have been incorporated in later investigations.

Table 4: Categories of Variables (Antecedents of Information Search)

Category of Variable*	Examples of Variables
Market Environment	Number of alternatives; Price dispersion; Homogeneity
Situational Variables	Time pressure; Ease of access
Potential Payoff	Perceived risk
Knowledge and Experience	Prior product knowledge; Objective knowledge; Subjective knowledge
Individual Difference	Risk aversion; Tolerance for ambiguity; Demographics
Conflict and Conflict Resolution	Satisfaction; Dissonance
Cost of Search	Perceived cost

* Categories of variables as suggested by Beatty and Smith, 1987

We address this issue of identifying antecedent variables through an investigation of the *strengths* and *directions* of the relationships between the various antecedent variables and information search (offline). As implied by the large number of candidate predictor variables (e.g., Sharon and Beatty list 60 variables) a study of the determinants of search can be quite complex. A meta-analysis is therefore conducted with information search as the dependent variable.

Selecting Studies

Studies included in the meta-analysis are chosen if they share the same criterion variable: *information search*. Specifically, those studies are included that operationalize information search (in extant literature) as: 1) Depth of search, which is the total amount of search (defined as: number of alternatives/brands taken into consideration, number of attributes considered, the number of times a particular source was examined *or* the extent of search) (e.g., Moorthy, et al. 1997; Gregan Paxton and Roedder John 1995; Jacoby, et al. 1974; Scammon 1977; Malhotra 1982; Biehal and Chakravarti 1982); and 2) Time spent on searching, defined as the total time required to complete a search and make a choice (e.g., Brucks 1985).

The findings of 65 studies represent the empirical work that fit the above criteria in the business, psychological, and sociological literatures until (and including) 2003. The studies, listed in Table 5, are identified via the following search procedure:

1) A key word search in the ABI/Inform database, which contains citations and abstracts from over 1,400 US and international journals and trade magazines from 1971 to the present. All the premier business and management journals are covered by this database. Key words utilized for the search included the

combinations: (total search); (information search); (external search); and (search effort).

2) A key word search in the non-business-specific databases including: PsychInfo (psychology); Sociological Abstracts (sociology); Social Science Citation Index (social science); Social Sciences Abstracts (social science).

3) A strengthening literature search in EBSCOhost databases, which include various databases in social sciences. We narrow our search in the following databases: Academic Search Premier, Business Source Premier, Psychology and Behavioral Sciences Collection, and Sociological Collection.

4) A search for conference papers via the listings of conference proceedings in "Papers First" database; "Advances in Consumer Research" online proceedings.

5) An interactive search of the references from every relevant article identified from the key word search, until no new suitable references could be identified.

6) A letter has been mailed out to the authors whose works have appeared in this field (of information search in the offline environment), requesting for their published and unpublished studies on this topic.

We attempt to complete an extensive search of the published as well as unpublished literature. The studies identified, though not necessarily exhaustive, are believed to represent a fairly well-rounded set of studies in this area. Following is a list of studies that have been included in the meta-analysis. The independent and dependent variables, along with the theoretical framework used in the study are also listed (Table 5).

Table 5: Studies With Information Search (Offline) as Dependent Variable

Sl. No.	Authors (Date)	Published Journal	Independent Variables	Dependent Variable	Theory
1	Jacoby, Jacob, Robert W. Chestnut, William A. Fisher (1978)	*Journal of Marketing Research*	Brand loyalty (-) Motivation level (+) Product importance (+) Perceived risk (+) Prior experience (-)	Depth of search Time	Utility Theory
2	Sheluga, David A., James Jaccard, Jacob Jacoby (1979)	*Journal of Consumer Research*	Attribute importance (+) Sequence (+)	Depth of search	Utility Theory Theory of Consideration Sets
3	Moore, William L., Donald R. Lehmann (1980)	*Journal of Consumer Research*	Time pressure (-) Financial pressure (+) Perceived obesity (+) Perceived risk (+) Prior experience (-) Intelligence (-) Processing style (+)	Depth of search	Cost-Benefit Framework
4	Schaninger, Charles M., Donald Sciglimpaglia (1981)	*Journal of Consumer Research*	Heterogeneity (+) Number of attributes (+) Age (-) Socio-eco status (-) Tolerance for ambiguity (+) Cognitive style (-) Trait anxiety (-) Self esteem (+) Rigidity (-) Certainty (+)	Depth of Search	Theory of Stimulus Complexity Theory of Perceived Risk Tolerance for Ambiguity

Sl. No.	Authors (Date)	Published Journal	Independent Variables	Dependent Variable	Theory
5	Kaas, Klaus Peter (1982)	*Journal of Business Research*	Prior knowledge (-) Prior knowledge (-)	Depth of search	Theory of Buyer Behavior
6	Midgley, David F. (1983)	*Journal of Marketing*	Income (-) Prior experience (-) Store assistance (+) Goal directed (+)	Time	Theory of Social Comparison
7	Punj, Girish N., Richard Staelin (1983)	*Journal of Consumer Research*	Size of feasible set (-) Cost of search (-) Desire to seek info (+) Prior experience (+) Prior knowledge (-)	Depth of Search	Cost-Benefit Framework
8	Brucks, Merrie (1985)	*Journal of Consumer Research*	Objective knowledge (+) Subjective knowledge (+) Complex task (+) Simple task (+)	Depth of Search	Inverted-U shaped curve
9	Painton, Scott, James W. Gentry (1985)	*Journal of Consumer Research*	Traditional IDB (+) Traditional IDB (+) Picture (+) Picture (+)	Depth of Search	Cost of Search (Memory search as cost)
10	John, Deborah Roedder, Carol A. Scott, James R. Bettman (1986)	*Journal of Consumer Research*	Cost (-) Belief	Depth of Search	Cost-benefit framework
11	Urbany, Joel E. (1986)	*Journal of Consumer Research*	Price Dispersion (+) Cost of search (-) Uncertainty (+)	Depth of Search	Cost-benefit framework
12	Bruner, Gordon C. II (1986)	*Journal of Retailing*	Desired state (+)	Depth of Search	Problem recognition and personality types (AS/DS)

Sl. No.	Authors (Date)	Published Journal	Independent Variables	Dependent Variable	Theory
13	Rosen, Dennis L., Olshavsky, Richard W. (1987)	*Journal of Business Research*	Perceived risk (-) Cost (-)	Depth of Search	
14	Park, C. Whan, Henry Assael, Seoil Chaiy (1987)	*The Journal of Consumer Marketing*	Trialability (+) Involvement (+)	Depth of Search	Risk Theory; Involvement Theory
15	Freiden, Jon B., Goldsmith, Ronald E.(1988)	*Services Marketing Quarterly*	Education Job Income Age Number of children Assertiveness	Depth of Search	
16	Urbany, Joel E.,Peter R. Dickson, William L. Wilkie (1989)	*Journal of Consumer Research*	Knowledge uncertainty (-) Choice uncertainty (+) Knowledge uncertainty (-) Choice uncertainty (+)	Depth of Search Time	Cost-benefit framework
17	Brucks, Merrie, Paul H. Schurr (1990)	*Journal of Consumer Research*	Attribute bargainability (-) Attribute Range Knowledge (+)	Time Depth of Search	Cost-benefit framework
18	Maute, Manfred F., William R. Forrester Jr. (1991)	*Journal of Economic Psychology*	Attribute importance (-) Price dispersion (+) "Search" quality (-) "Experience" quality (+) "Credence" quality (-)	Time	Cost-benefit Framework; Cognitive costs
19	Julie L. Ozanne, Merrie Brucks, Dhruv Grewal *(1992)*	*Journal of Consumer Research*	Discrepancy factor (InvU) Category type (InvU)	Depth of Search Time	Cost-benefit Framework; Economic Theory Cognitive costs Conflict Theory

Sl. No.	Authors (Date)	Published Journal	Independent Variables	Dependent Variable	Theory
20	Dawar, Niraj, Philip M. Parker, Linda J. Price (1996)	*Journal of International Business Studies*	Uncertainty avoidance Power distance Individualism	Depth of Search	Hofstede's 5 factors
21	Putrevu, Sanjay, Brian T. Ratchford (1997)	*Journal of Retailing*	Price dispersion (+) Opportunities (+) Product importance (+) Cost of search (-) Time pressure (+) Enjoyment (+) Prior experience (+) Ability (+) Efficiency (+)	Depth of Search	
22	Ling-yee, Li (1997)	*Journal of International Consumer Marketing*	Involvement (+) Residence type (Private residence) (+) Gender (Male) (-) Income (Low income) (-)	Depth of search	
23	Moorthy, Sridhar, Brian T. Ratchford, Debabrata Talukdar (1997)	*Journal of Consumer Research*	Relative brand uncertainty (+) Involvement (+) Individual brand uncertainty (+) Risk aversion (+) Search cost (-)	Depth of Search	Cost-benefit framework
24	Dholakia, Utpal M. (2001)	*European Journal of Marketing*	Perceived risk (+) Involvement (+)	Depth of Search	Risk theory
25	Girish Punj, Richard Brookes (2001)	*Psychology & Marketing*	Constraints (-)	Depth of search	
26	Mattila, Anna S., Jochen Wirtz (2002)	*International Journal of Service Industry Management*	Knowledge: Objective (-) Subjective (-) Objective (+) Subjective (+)	Depth of Search	Objective and subjective knowledge

Sl. No.	Authors (Date)	Published Journal	Independent Variables	Dependent Variable	Theory
27	Mieneke W H Weenig, Marleen Maarlevel (2002)	*Journal of Economic Psychology*	Time constraints (-)	Depth of search	
28	Klein, Lisa R., Gary T. Ford (2003)	*Journal of Interactive Marketing*	Income (-) Education (+) Objective Know. (+) Subjective (InvU) Prior Experience (+) Years of Internet Experience (+) Hours of Internet Experience (+) Age (-)	Depth of Search Time	
29	Laroche, Michel, Mark Cleveland, Elizabeth Browne (2004)	*Journal of Economic Psychology*	Traditional Belief (+) Concern for Children Bargain Hunter (+) Generous buyer (-) Purchase insecurity (+) Identity shaper (+) Time pressure (-) Cost of product (+) Budget (+) Selection Family size Employment status Relation to recipient Education Gender Marital status Income	Depth of Search	

Sl. No.	Authors (Date)	Published Journal	Independent Variables	Dependent Variable	Theory
30	Beatty, Sharon E., Scott M. Smith (1987)	*Journal of Consumer Research*	Ego Involvement (+) Involvement (+) Product knowledge (-) Time availability (+) Attitude towards (+) shopping	Depth of Search	Involvement
31	Zimmermann, Linda K., Loren V. Geistfeld, Loren V. (1984)	*Journal of Consumer Affairs*	Cost of search (-) Education (+) Price dispersion (-)	Depth of search	
32	Srinivasan, Narasimhan, Brian T. Ratchford (1991)	*Journal of Consumer Research*	Prior experience (-) Involvement (+) Cost of search (+) Evoked set (+) Benefits of search (+) Perceived risk (+) Prior knowledge	Depth of search	Cost-benefit framework
33	Darley, William K. (1999)	*Psychology & Marketing*	Enjoyment (+) Benefit (+) Self-esteem Perceived product knowledge (+)	Depth of search	Cost-benefit framework
34	Biehal, Gabriel J. (1983)	*Journal of Marketing*	Prior knowledge	Depth of search	
35	Smith, J. Brock, Julia M. Bristo (1994)	*Psychology and Marketing*	Risk Uncertainty	Depth of search	Risk theory
36	Hill, C Jeanne, Motes, William H. (1995)	*The Journal of Services Marketing*	Gender (males) (+) Age (+) Educational attainment (+) Income (+)	Depth of search	
37	Janet R. McColl-Kennedy, Richard E. Fetter Jr. (1999)	*The Journal of Services Marketing*	Gender (males) Education Income	Depth of search	

Sl. No.	Authors (Date)	Published Journal	Independent Variables	Dependent Variable	Theory
38	DeSarbo, Wayne S., and Jungwhan Choi (1999)	*Journal of Econometrics*	Risk Aversion (+) Past Experience (-) Prior Knowledge (Product Knowledge) (-) Time Pressure (-) Belief (-) Savings From Search (+) Perceived Price Difference (Price Dispersion) (+) Evaluation Cost (-) Cost of External Search (-) Opportunity Cost of Time (-)	Depth of search	Two-stage search process
39	McColl-Kennedy, Janet R., and Richard E. Fetter, Jr. (2001)	*The Journal of Services Marketing*	Importance (+) Interest (+)	Depth of search	Involvement
40	Mande,l Naomi and Eric J. Johnson (2002)	*Journal of Consumer Research*	Priming (+)	Depth of search	Priming theory
41	Zinkhan, George M., Joachimsthaler, Erich A., Kinnear, Thomas C. (1987)	*Journal of Marketing Research*	Risk aversion (+) Cognitive differentiation (+) Prior experience (+) Managerial experience (+) Age (+) Involvement (+)	Depth of Search	
42	Heaney, Joo-Gim, Ronald E. Goldsmith (1999)	*The International Journal of Bank Marketing*	Benefit (+) Risk (+) Cost (-) Knowledge (+)	Depth of Search	
43	Ring, Alexander, Shriber, Mitchell, Horton, Raymond L. (1980)	*Journal of the Academy of Marketing Science*	Risk (+)	Depth of Search Time	

Sl. No.	Authors (Date)	Published Journal	Independent Variables	Dependent Variable	Theory
44	deTurck, Mark A., Goldhaber, Gerald M. (1989)	*The Journal of Consumer Affairs*	To learn (+)	Time	
45	Dickson, Peter R., Sawyer, Alan G. (1990)	*Journal of Marketing*	Frequency (-)	Time	Price Perceptions
46	Hill, C. Jeanne (2001)	*The Journal of Services Marketing*	Age (-) Income (+) Education (+) Expensive (+)	Depth of Search	Cost Theory
47	Carlson, John A., Gieseke, Robert J. (1983)	*Journal of Consumer Research*	Expenditure (+) Income Single/married (-) Age (+) Education (+)	Depth of Search	
48	Fast, Janet, Vosburgh, Richard E., Frisbee, William R. (1989)	*The Journal of Consumer Affairs*	Income (+) Age (-) Education (-) Prior experience (-) Perceived risk (+) Urgency of purchase (-)	Depth of Search	
49	Selnes, Fred, Sigurd Villads Troye (1989)	*Journal of Economic Psychology*	Prior knowledge (+)	Depth of Search	

Sl. No.	Authors (Date)	Published Journal	Independent Variables	Dependent Variable	Theory
50	Ratchford, Brian T., Srinivasan, Narasimhan (1993)	*Marketing Science*	List price (+) Manufacturer's rebate (+) Number of dealers (-) Inventories (-) Education (-) Knowledge (-) Experience (-) Positive experience (-) Wage (-) Benefits of search (+)	Total Time	
51	Weiss, Allen M, Heide, Jan B. (1993)	*Journal of Marketing Research*	Pace of tech change (+) Tech heterogeneity (+) Switching cost (-) Prior experience (-)	Depth of Search Time	
52	Kujala, Jouni T, Johnson, Michael D. (1993)	*Journal of Economic Psychology*	Price importance Gender	Depth of Search	
53	Smith, J Brock, Bristor, Julia M. (1994)	*Psychology and Marketing*	Purchase involvement (+) Uncertainty orientation (+) Durable goods (+) Risk	Depth of Search	
54	Motes, William H, Huhmann, Bruce A, Hill, C. Jeanne (1995)	*Journal of Health Care Marketing*	Income (-) Education (+)	Depth of Search	
55	Avery, Rosemary J. (1996)	*The Journal of Consumer Affairs*	Time pressure (-) Income (-) Benefits (+) Involvement (+) Gender	Depth of Search	

Sl. No.	Authors (Date)	Published Journal	Independent Variables	Dependent Variable	Theory
56	Anglin , Paul M. (1997)	*Real Estate Economics*	Unfamiliar Prior Experience Price Gender Income	Depth of Search Time	
57	Smith, Gerald E. (2000)	*The Journal of Product and Brand Management*	Search cost Prior knowledge	Depth of Search	Cost
58	Laroche, Michel, Gad Saad, Chankon Kim, Elizabeth Browne (2000)	*Journal of Business Research*	Budget Cost Selection Gender Age Education	Depth of Search	
59	Srivastava, Joydeep and Nicholas Lurie (2001)	*Journal of Consumer Research*	Cost Refund Low price	Depth of Search	
60	Mieneke, W. H., and Marleen Maarleveld Weenig (2002)	*Journal of Economic Psychology*	Time pressure (-)	Depth of Search	
61	Punj, Girish and Richard Brookes (2002)	*International Journal of Research in Marketing*	Market-related constraints Household-related constraints	Depth of Search	
62	Berning, Carol A. Kohn and Jacob Jacoby (1974)	*Journal of Consumer Research*	Innovativeness Price (search)	Depth of Search	
63	Capon, Noel, and Marian Burke (1980)	*Journal of Consumer Research*	Socio-economic status Perceived risk Increased information availability Memory aid present	Depth of Search	
64	Kiel, Geoffrey C. and Roger A. Layton (1981)	*Journal of Marketing Research*		Depth of search	

Sl. No.	Authors (Date)	Published Journal	Independent Variables	Dependent Variable	Theory
65	Jacoby, Jacob, James J.Jaccard, Imran Currim and Alfred Kuss (1994)	*Journal of Consumer Research*	Tracing	Depth of Search	

META-ANALYSIS

The meta-analysis technique is used to assess effect sizes, the distributions and central tendencies for various correlates of information search (i.e., the dependent variable). As mentioned earlier, the studies that are included in the meta-analysis, operationalize information search in broadly two ways: depth of search and time taken to undertake the search. However, as can be seen from Table 5 (above), "depth of search" is found more often than "time" for measuring the dependent variable. Additionally, the two measures are often used in the same study. Therefore, instead of carrying out two separate meta-analyses (for differently operationalized dependent variables), all operationalizations are treated broadly as information search, and the meta-analysis is carried out for a single dependent variable.

Many independent variables (a total of 81) have been uncovered in our search for suitable studies for the meta-analysis. A list of the independent variables are provided in Table 6, divided in two groups:

a) variables that are found in **at least 3 studies** (37 variables are uncovered) and hence **included** in the meta-analysis, *and*

b) variables that are found in **less than 3 studies** (44 variables are uncovered), and therefore **are not included** of the formal meta-analysis.

Uncovering Clusters

Before conducting the meta-analysis, as a part of better understanding offline information search, we propose to a) categorize the identified variables into the seven categories suggested in extant literature, and b) determine if there are other categories that exist, but which have not been formally identified in the information search literature. In other words, we are interested in determining if all the antecedent variables revealed during the search (for variables for the meta-

Table 6: Various Independent Variables

Independent Variables included in the Meta-Analysis	Other Independent Variables NOT included in the Meta-Analysis
Age	Advertised Product
Anxiety	Best Choice
Belief	Brand Loyalty
Benefits	Business Attitude
Cost	Category Type
Dispersion	Change
Education	City Background
Employment	Complex
Finance	Consequence
Gender	Desire
Income	Family Size
Involvement	Foreign Manufacturer
Knowledge	Generic Buyer
Number	Goal Directedness
Perceived Risk	Hofstede
Prior Experience	IDB
Time Pressure	Identity Shaper
Attribute Importance	Individual Difference
Bargain Hunter	Innovativeness
Children	Intelligence
Christmas	Inventory
Concern	Investment Search
Durability	Low Compensation
Generous Giver	Managerial Experience
Importance of Friend's Advice	Market Maven
List Price	Memory Aid
Marital Status	Motivation Level
News Read	Nutrient
Processing Style	Opportunity
Product Importance	OSL
Refund Given	Perceived Obesity
Responsibility	Priming
Search/ Credence/ Experience	Quality
Self Esteem	Reference
Shopping Trips	Residence Type
Tracing	Rigidity
Women	Salesperson

Independent Variables included in the Meta-Analysis	Other Independent Variables NOT included in the Meta-Analysis
	Sequence
	Simple
	Time Available
	Transient
	Trial
	Unfamiliar
	Word / Picture

analysis) adhere to these seven clusters that have been suggested by Sharon and Beatty (1987), or if there are additionally completely new clusters of variables that have not been previously identified.

For determining the said "clusters", we appoint 3 independent judges. These investigators were provided with a description of the seven categories, as suggested by the above-mentioned authors (Table 4), and are asked to assign the uncovered variables (from Table 6) into these categories. They are further instructed that those variables that cannot be assigned to these existing categories be assigned to "new" categories(y) as they deem fit. In other words, for the variables that are perceived as not belonging to one of the existing categories, new categories would be created and these variables would be assigned to those new categories[7].

Clusters of Variables

It seems that the number of categories are still the same (See Table 7). The seven categories sill remain. Inter-rater agreement on this is a hundred percent. All judges agreed that no new clusters emerged.Even though for the categorization of the individual variables, inter-rater agreement is 96.7%. Next, we discuss the various clusters of variables and their relationships with consumer information search.

[7] All the judges are familiar with marketing literature and the antecedent variables. However, to further clarify matters, a definition of each antecedent variable and each existing cluster is provided.

Table 7: Various Independent Variables (Assigned to Categories)

Independent Variables included in the Meta-Analysis	Other Independent Variables NOT included in the Meta-Analysis
Market Environment	**Market Environment**
Dispersion	Advertised product
List Price	Change
Number of alternatives	Identity shaper
Situational Variables	**Situational Variables**
Attribute importance	Category type
Durability	Complex
Product importance	Foreign manufacturer
Search/ Credence/ Experience	IDB
Time pressure	Inventory
Tracing	Memory aid
	Nutrient
	Opportunity
	Priming
	Quality
	Salesperson
	Sequence
	Simple
	Word / picture
Potential Payoff	**Potential Payoff**
Perceived risk	Consequence
Refund given	
Knowledge and Experience	**Knowledge and Experience**
Knowledge	Managerial experience
Prior experience	
Individual Difference	**Individual Difference**
Age	Brand loyalty
Anxiety	Best choice
Bargain hunter	Business attitude
Belief	City background
Christmas lover	Desire
Concern	Family size
Education	Generic buyer

Independent Variables included in the Meta-Analysis	**Other Independent Variables NOT included in the Meta-Analysis**
Employment	Goal directedness
Finance	Hofstede
Gender	Individual difference
Generous giver	Innovativeness
Have Children	Intelligence
Importance of friend's advice	Low compensation
Income	Market Maven
Involvement	Motivation level
Marital Status	OSL
News read	Perceived obesity
Processing style	Reference
Responsibility	Residence Type
Self Esteem	Rigidity
Shopping trips	Transient
Women	

Conflict and Conflict Resolution

Cost of Search	**Cost of Search**
Benefits	Investment search
Cost	Time available
	Trial
	Unfamiliar

Market Environment

Dispersion: Dispersion is difference among brands (in terms of attribute differences as well as price differences) that are currently available in the market. Ratchford (1982), has argued that search costs are unaffected by the magnitude of differences among brands and that inter-brand differences are positively associated with information search because the benefits derived from making a high quality purchase decision increase dramatically in dispersed markets.

H1: The greater the dispersion, the more is the amount of information search undertaken. (+)

List Price, Number of alternatives: The greater price listed on a product, the greater the amount of information search (Ratchford and Srinivasan 1993).

H2: The greater the list price, the more is the amount of information search undertaken. (+)

Number of Alternatives: A large number of studies, in the off-line environment, have experimented the relationship between the amount of information present and the amount of search undertaken. Studies on information overload (e.g., Jacoby et al, 1974; Malhotra, 1982) have shown that, as the amount of information increases, the amount of search undertaken by consumers decreases. This problem holds true even when consumers express explicit wishes for a larger amount of information.

H3: The greater the number of alternatives, the more is the amount of information search undertaken. (-)

Situational Variables

Attribute importance: For almost any product or service, it is apparent that consumers value the information conveyed by some attributes more highly than others. Although it is not clear that important attributes are more costly to search, the disproportionate increase in search benefits conferred by the acquisition of information on these attributes suggests that attribute importance should be positively associated with increased search (Newman 1977; Moore and Lehmann 1980; Ratchford 1982).

H4: The greater the attribute importance, the more is the amount of information search undertaken. (+)

Durability: Durable purchase decisions (those made infrequently for relatively expensive items), are generally thought to involve more uncertainty than non-durable purchase decisions (Smith and Bristor 1994). Durable products are greater differentiated and hence, consumers experience greater difficulty in coding information (Engel et al., 1986).

H5: The greater the durability (of the product), the more is the amount of information search undertaken. (+)

Product importance:

Predictions about search behavior derives from the simple utility equation: search will continue for as long as the perceived value of the information exceeds the cost of obtaining this information (Engel, Kollat and Blackwell, 1973; Lanzetta 1963). The major determinant of search behavior is the perceived value (or importance) attached to information.

H6: The greater the product importance, the more is the amount of information search undertaken. (+)

Search/ Credence/ Experience:

The development of the attribute qualities framework can be traced to the work of Nelson (1970) and Darby and Karni (1973). The framework is comprised of three categories of properties – search, experience and credence qualities, each of which refer to a different point in the consumer decision-making process when it is possible, if ever, to accurately and efficiently evaluate product performance (Ford et al. 1988).

Search attribute qualities. Those qualities of a product that can be accurately and efficiently evaluated prior to purchase using knowledge, inspection, reasonable effort and normal channels of information acquisition such as consumer reports.

Experience attribute qualities. Those qualities of a product that can be accurately and efficiently evaluated only after the product has been purchased and used for a short period of time in comparison to the product's total-usage life.

Credence attribute qualities. Those qualities of a product that cannot be accurately and efficiently evaluated even after the product is used extensively because of the consumer's lack of technical expertise, or because the cost of acquiring sufficient, accurate information is prohibitively greater than its expected value.

H7: Credence goods result in the most amount of information search undertaken as compared to experience goods and search goods. (+)

Time pressure: Claxton, Fry and Portis (1974) and Katona and Mueller (1955) found that urgency was negatively related to external search.

H8: The greater the time pressure, the less is the amount of information search undertaken. (-)

Tracing: Tracing is defined as letting the participant know that data are being collected before the data collection is conducted (Jacoby et al, 1994).

H9: The greater the tracing, the less is the amount of information search undertaken. (-)

Potential Payoff (Perceived Risk)

Perceived risk: Weber and Bottom (1990) define perceived risk as "choices among alternatives that can be described by probability distributions over possible outcomes" (p. 114). They add an implicit assumption that at least one of the possible outcomes must be undesirable (or at least less desirable than the others) for risk to exist. Studies conducted in the off-line environment, have found that perceived risk of the product are positively related to the total search undertaken (Srinivasan and Ratchford, 1991; Chaudhuri, 2000). It is of interest to find out whether similar kind of behavior is observed in the on-line environment. It is proposed that:

H10: The greater the perceived risk associated with buying the product, the greater the amount of search undertaken. (+)

Refund given: The price-matching refund policies signals to consumers that stores that have a cost advantage or want to build sales volume, use these policies to indicate that their prices are low (Jain and Srivastava 2000; Srivastava 1999). It follows that consumers will find it less beneficial to search for more information in this environment (Moorthy, Ratchford and Talukdar 1997). Therefore, less search will be undertaken when there is a refund policy.

H11: The greater the refund given, the less is the amount of information search undertaken. (-)

Knowledge and Experience

Knowledge: Consumer product class knowledge has been defined as an individual's perception of how much the consumer knows (e.g., Gardner 1984) or as the amount, type or organization of what an individual actually has stored in memory (e.g., Staelin, 1978). Several studies show a negative relationship between the amount of product experience and information search (Newman and Staelin, 1971, 1972). One possible explanation for this finding is the fact that experienced searchers have substantial prior knowledge, so they do not require a lot of information from external sources (Brucks, 1985). Prior product knowledge is defined as the amount of knowledge or information that the consumer has for the product class for which the search is being undertaken. It has been observed in the off-line environment that a better understanding of how to make a decision increases search, but better information on brand attributes decreases search (Urbany, et al. 1989). It is proposed that prior product knowledge will affect the amount of search undertaken by the consumer.

H12: The greater the product knowledge, the more is the amount of information search undertaken. (+)

Prior experience: Another possible explanation offered is that because of the prior knowledge, consumers are aware of the attributes that are more useful in "discriminating"

between the different brands in the product category, and therefore only those are considered while conducting search (Brucks, 1985).

Some studies suggest that existing knowledge makes it easier to process new information (Johnson and Russo, 1984; Punj and Staelin, 1983). Furthermore, some studies propose the existence of an inverted U-shaped relationship between prior knowledge and information search (Johnson and Russo, 1984). The inverted U-shaped relationship has its own appeal, as it helps to explain the contradictory views held in extant literature. It means that when there is a low-to-moderate prior knowledge or experience regarding a particular product, one will engage in more search (i.e., the relationship with the amount of search undertaken will be positive) and when the existing product knowledge is moderate-to-high, lesser amount of search will be undertaken (i.e., the relationship with the amount of search undertaken will be negative) (Brucks, 1985).

H13: The greater the prior experience, the more is the amount of information search undertaken. (+)

The marketing literature shows that the Effort/Satisfaction theory evaluates the effort that a person expends in reaching a goal and the satisfaction that the person experiences upon attainment of the goal (Hanna, 1978). This satisfaction is a function of interpersonal factors. Overall satisfaction models provide a better fit in predicting repurchase intentions than does attribute performance models (Mittal et al, 1998). Therefore, if consumers have positive prior experience, there is an increased chance that they will engage in repeat purchase behavior and hence will engage in lesser amount of search. The amount of perceived cost will also be lesser.

Individual Difference

Age, Education, Employment, Finance, Income, Gender, Women: Age is an important factor for search behavior (Hill and Motes, 1995; Schaninger and Siglimpaglia, 1981). The literature on age-related differences yielded a number of explanations as to why older individuals' information search patterns exhibit variations from those of younger individuals.

These explanations can be grouped into two bodies: (1) differences attributable to changes that occur in the external environment as a person grows older, as well as the (perhaps resulting) psychological changes that accompany aging; and (2) differences attributable to changes in the processing abilities, memory, and learning abilities of older people.

H14: The greater the age of the consumer, the lesser is the amount of information search undertaken. (-)

The relationship between demographic variables and search behavior has been addressed by several researchers. In Schaninger and Sciglimpaglia's (Schaninger and Sciglimpaglia, 1981) study, age was negatively related to the extent of search. Additionally, younger and more educated housewives who were earlier in the family life cycle and of higher social class examined more information. Financial pressure was found to be negatively related to external information search by Claxton, Fry and Portis (1974). Gender is a potentially pertinent factor in determining the amount of information search undertaken (Hill and Motes 1995).

H20: The greater the education, the more is the amount of information search undertaken. (+)

H21: Those with employment, undertake more amount of information search. (+)

H22: The greater the financial pressure, the more is the amount of information search undertaken. (+)

H23: Men undertake more amount of information search. (+)

H27: The greater the income, the less is the amount of information search undertaken. (-)

H35: Women tend to search less for information. (-)

Anxiety: Anxiety is an important factor for search behavior (Schaninger and Siglimpaglia, 1981).

H15: The greater the anxiety (on part of the consumer), the more is the amount of information search undertaken. (+)

Bargain hunter: Since generic-buying individuals are apt to heuristically purchase noname brands, they are therefore expected to report less information search effort (Laroche, et

al 2004). Bargain hunters tended to acquire more general information on clothing alternatives – this variable is uniquely common across all four age groups.

H16: The greater the bargain hunting trait, the more is the amount of information search undertaken. (+)

Belief: Consumers with more experience, more knowledge, stronger subjective belief about brands, and more urgent need are less likely to decide to do external search in both product categories under investigation (deSabro 1999; RoedderJohn, et al 1986).

H17: The greater the belief, the less is the amount of information search undertaken. (-)

Christmas lover: Laroche, Kim, Saad, and Browne (2000) show that the greater the love for traditional Christmas celebrations, there is a greater amount of information search that is undertaken (in a gift-giving scenario)

H18: The greater the Christmas loving trait, the more is the amount of information search undertaken. (+)

Concern: The greater the involvement and concern for a product, the greater is the information search undertaken. (Weiss and Heide, 1993).

H19: The greater the concern, the more is the amount of information search undertaken. (+)

Generous giver: For those individuals characterized as being a generous giver, information search is likely to be more effortful and comprehensive (Laroche et al, 2004).

H24: The greater the generous giver trait, the more is the amount of information search undertaken. (+)

Have Children, Marital Status: One of the novel factors that the authors found was "concern for children" (Laroche, et al 2004; RoedderJohn, et al 1986). Their studies showed that a greater concern will lead to a greater information search. Marital Status (Moore & Lehmann, 1980).

H25: The more the children, the more is the amount of information search undertaken. (+)

H29: Married people undertake more amount of information search. (+)

Importance of friend's advice: Lumpkin and Greenberg (1982) did not find evidence to support the notion that the elderly are greater users of mass media, they did determine that

interpersonal sources (such as friends, spouse, and to a lesser degree, salespersons) are influential information sources for the elderly. Phillips and Sternthal (1977) concluded that for elderly individuals, very substantial portions of interpersonal contacts are with members of the extended family.

H26: The greater the importance of a friend's advice, the less is the amount of information search undertaken. (-)

Involvement: The construct of involvement has received considerable attention by academic researchers (Engel *et al.,* 1978; Rothschild, 1984; Brisoux and Cheron, 1990) over the past two decades. During this time various types of involvement have been described and attempts made at measurement. For example, Beatty *et al.* (1988) define ego involvement as ``the importance of the product to the individual and to the individual's self-concept and ego.'' This is similar to enduring involvement, which has been defined as ``an ongoing concern for a product class, that is, it is independent of purchase situations and is motivated by the degree to which the product relates to the self and/or hedonic pleasure received from the product'' (Richins and Bloch 1986).

H28: The greater the involvement, the more is the amount of information search undertaken. (+)

News read: News read is an indication of less information is collected, because more time is spent reading the newspaper (Bucklin 1969). Therefore, it is suggested that:

H30: The greater the news read, the less is the amount of information search undertaken. (-)

Processing style: Assuming that an individual's processing abilities diminish with age, it is likely that he/she would tend to rely on less effortful processing strategies. While younger people are thought to undertake a relatively detailed analysis of available information, the elderly are posited to employ heuristic or schema-based forms of processing (Yoon 1997). Yoon states

that, ‘‘schema-based processing is generally considered to be easier to engage in than detailed processing, because it involves assessing information at a theme or schema-level rather than at the level of specific details’’ (p. 330). The latter strategy requires searching memory contents and making exact matches, which may exceed the processing capacity of older individuals.

H31: The greater the information processed, the more is the amount of information search undertaken. (+)

Responsibility, Self Esteem: A number of perceived risk studies have shown that self-esteem is positively related to confidence in evaluating alternatives and making a purchase decision (Cox 1967a). Also, it is negatively related to anxiety scales. Further, anxiety and low self-esteem are negatively related to information search (Schaninger and Siglimpaglia 1981). This follows individuals with high self-esteem will tend to search for more information.

H32: The greater the sense of responsibility, the more is the amount of information search undertaken. (+)

H33: The greater the self esteem, the more is the amount of information search undertaken. (+)

Shopping trips: The Number of shopping trips undertaken means that each shopping trip involves some additional information search (Bucklin 1969). This means that:

H34: The more the shopping trips, the more is the amount of information search undertaken. (+)

Cost of Search

Benefits, Cost: Punj and Staelin (1983) propose that cost of search is negatively related and benefits of search are positively related to the amount of search and directly affect the amount of search undertaken by the consumer. Therefore, it is proposed that:

H36: The greater the benefits, the more is the amount of information search undertaken. (+)

H37: The greater the perceived cost, the less the amount of search undertaken by consumers on the Internet. (-)

METHOD

Computation and Coding

Effect size estimate is defined as an estimate of the degree to which the predictor-criterion variable relationship is present in the population of information search research. The term effect size refers to the sample estimate of the population effect regardless of the particular effect size indicator used (Fern and Monroe 1996). In this study, although the correlation coefficient (r) is the most common metric reported in these studies, F, t, and Chi-square statistics also emerge from some studies. To examine the strength of the relationship or effect of interest, we convert various (all metrics other than r) summary statistics into a common metric, in the form of r (correlation coefficient). We convert various test statistics (e.g., F, t, Z, chi-square) to r following the formula suggested by Hays (1973), Kendall and Stuart (1967), Rosenthal (1991), and Wolf (1986). The weighted effect size (weighted average r) is weighted using the relevant sample size. The above transformations (and subsequent analyses) have been carried out on those antecedents that have been uncovered in **3 or more studies**. As mentioned earlier, there are 37 such variables that have been included in the meta-analysis.

Some studies provide more than one test of significance relevant to the hypothesis that the meta-analysis is examining. For instance, a study may report several effect size estimates for one predictor using the same subjects. In order to obtain a single result for the multiple correlated results from a single study, we use the average of the statistics that examine the same relationship. For correlational relationships, this is typically done by transforming the raw Pearson correlation coefficients (r) into its associated Z statistic and then transform back to r (Wolf 1986).

It is widely acknowledged that not all studies synthesized in a meta-analysis should be given equal weight (Hunter and Schmidt 1990; Rosenthal 1991; Wolf 1986). Some studies may be based on very small or unrepresentative samples. To give studies equal weight may lead to the less representative studies contributing just as much weight to the results of our meta-analysis as those more well-designed studies. The effect size (r) is weighted using the relevant sample size. Our objective is to cover those antecedents to consumers' information search (i.e., total amount of information *and* time taken for search) that show medium to large effect sizes from previous cumulative research efforts.

Note that for individual difference variables (i.e., concern, generous giver), the total variances are smaller than the sampling error variances. Hunter and Schmidt (1990) explained the situation (p.109). The estimated variance of population correlations is not computed as a conventional variance, i.e., the average squared deviation of given numbers. Rather it is computed as the difference between the given variance of observed correlations and the statistically given sampling error variance. While there is little error in the statistically given sampling error variance, the variance of observed correlations is a sample estimate. Unless the number of studies is infinite, there will be some error in that empirical estimate. Thus, in our case, sampling error caused the variance of observed correlations to differ slightly from the expected value, and that error caused the estimating total variance smaller. There is no logical contradiction here.

File Drawer Problem

File drawer problems occur because published studies tend to be biased toward positive findings. Non-significant findings generally go unpublished and are more likely to be buried away in file drawers. This may enhance the likelihood of a Type I bias error in finding more

positive results than is really the case. File drawer N indicates the number of studies confirming the null hypothesis that would be needed to reverse a conclusion that a significant relationship exists. The file drawer N was estimated for three levels of significance −− .05 and .10 (these are the standard confidence intervals that are usually adopted for statistical significance).

Findings

Some important results of the meta-analysis are provided in Tables 8 and 9[8]. Table 8 gives, for each independent variable: the total number of studies, the total sample size, unweighted mean r (along with the 95% confidence interval), weighted mean r (sample-size adjusted mean) (along with the 95% confidence interval), level of significance of weighted mean r, total variance, sampling error variance and the number of file drawer studies required at significance levels 0.05 and 0.1 for an effect size of null.

Some independent variables (e.g., cost/benefit, perceived risk, involvement) show medium to large effect sizes and are highly significant in their relationships with the dependent variable (i.e., information search). In contrast, the effect sizes for demographic variables (e.g., self esteem, list price) are relatively small and are not statistically significant.

[8] All calculations, excepting for those required for Moderator Analysis (see later), are conducted using META5.3, a DOS-based program, developed by Ralf Schwarzer of Freie Universität Berlin, Institute for Psychology, Berlin, Germany.

Table 8: Effect Sizes of Various Independent Variables (Only cases where $K^9 > 3$)

Dependent Variable : Depth of Search

Independent Variables *Hypothesis Supported/ Not Supported*	**Total Number of Studies K (Cumulat Sample) (N)**	**Unweighted Mean r**	**Unweighted Mean r Confidence Interval (95%)**	**Weighted Mean r**	**Weighted Mean r Confidence Interval (95%)**	**Significance Weighted Mean r**	**Total Variance**	**Sampling Error Variance**	**File Drawer**	
									.05	**.10**
Overall	374 (106155)	0.06166	0.055632 to 0.067682	0.07734	0.071324 to 0.083347	0.00000	0.05107	0.00348	205	85
Market Environment										
Dispersion *H1 (+) Supported*	21 (5666)	0.19609	0.170784 to 0.221129	0.21831	0.193236 to 0.243100	0.00000	0.04881	0.00335	71	25
List Price *H2 (+) Not Supported*	5 (944)	0.07679	0.012637 to 0.140317	0.04328	-0.020991 to 0.107204	0.09196	0.01789	0.00528		
Number of Alternatives *H3 (-) Not Supported*	17 (5561)	0.08958	0.063335 to 0.115708	0.18977	0.164191 to 0.215088	0.00000	0.08149	0.00284	48	16

[9] K = Number of studies in which a particular antecedent variable occurs

Independent Variables *Hypothesis* *Supported/ Not Supported*	**Total Number of Studies K (Cumulat Sample) (N)**	**Unweighted Mean r**	**Unweighted Mean r Confidence Interval (95%)**	**Weighted Mean r**	**Weighted Mean r Confidence Interval (95%)**	**Significance** **Weighted Mean r**	**Total Variance**	**Sampling Error Variance**	**File Drawer**	
									.05	**.10**
Situational Variables										
Attribute Importance *H4 (+)* *Not Supported*	3 (317)	0.40319	0.305673 to 0.492327	0.05262	-0.058940 to 0.162891	0.17518	0.29894	0.00941		
Durability *H5 (+)* *Supported*	5 (854)	0.16476	0.098291 to 0.229767	0.11933	0.052184 to 0.185395	0.00024	0.10373	0.00569	7	1
Product Importance *H6 (+)* *Supported*	8 (2094)	0.11356	0.070853 to 0.155850	0.12026	0.077605 to 0.162468	0.00000	0.00534	0.00371	12	2
Search/ Credence/ Experience *H7 (+)* *Supported*	3 (546)	0.11056	0.026428 to 0.193138	0.11056	0.026428 to 0.193138	0.00486	0.00025	0.00536	4	1
Time Pressure	21 (4829)	-0.19957	-0.226669 to -0.172162	-0.14097	-0.168677 to	0.00000	0.05632	0.00418	39	9

Independent Variables *Hypothesis* *Supported/ Not Supported*	**Total Number of Studies K (Cumulat Sample) (N)**	**Unweighted Mean r**	**Unweighted Mean r Confidence Interval (95%)**	**Weighted Mean r**	**Weighted Mean r Confidence Interval (95%)**	**Significance Weighted Mean r**	**Total Variance**	**Sampling Error Variance**	**File Drawer**	
									.05	**.10**
H8 (-) Supported					-0.113037					
Tracing *H9 (-) Not Supported*	3 (262)	-0.01957	-0.141835 to 0.103281	-0.01923	-0.141498 to 0.103621	0.37837	0.00022	0.01144		
Potential Payoff										
Perceived Risk *H10 (+) Supported*	16 (3567)	0.11038	0.077639 to 0.142892	0.13119	0.098593 to 0.163514	0.00000	0.00938	0.00433	26	5
Refund Given *H11 (-) Not Supported*	4 (788)	0.21060	0.142462 to 0.276749	0.19099	0.122386 to 0.257774	0.00000	0.00209	0.00470	12	4
Knowledge and Experience										
Knowledge *H12 (+)*	43 (12090)	0.12023	0.102532 to 0.137853	0.11179	0.094060 to 0.129451	0.00000	0.02927	0.00347	54	6

Independent Variables *Hypothesis* *Supported/ Not Supported*	**Total Number of Studies K (Cumulat Sample) (N)**	**Unweighted Mean r**	**Unweighted Mean r Confidence Interval (95%)**	**Weighted Mean r**	**Weighted Mean r Confidence Interval (95%)**	**Significance Weighted Mean r**	**Total Variance**	**Sampling Error Variance**	**File Drawer**	
									.05	**.10**
Supported										
Prior Experience *H13 (+)* *Not Supported*	36 (10360)	-0.08998	-0.109146 to -0.070749	-0.03622	-0.055538 to -0.016879	0.00011	0.04165	0.00347		
Individual Difference										
Age *H14 (-)* *Supported*	23 (6118)	-0.03040	-0.055554 to -0.005210	-0.03510	-0.060247 to -0.009918	0.00302	0.01915	0.00375		
Anxiety *H15 (+)* *Supported*	22 (4821)	0.26951	0.242958 to 0.295665	0.23462	0.207584 to 0.261290	0.00000	0.01257	0.00406	82	30
Bargain Hunter *H16 (+)* *Supported*	6 (1427)	0.20457	0.154044 to 0.254025	0.16403	0.112830 to 0.214366	0.00000	0.00554	0.00398	14	4
Belief *H17 (-)* *Supported*	9 (1504)	-0.07163	-0.122141 to -0.020752	-0.06658	-0.117139 to -0.015679	0.00490	0.01052	0.00593	3	
Christmas Lover	4 (1153)	0.14151	0.084237 to 0.197843	0.14011	0.082822 to 0.196474	0.00000	0.00003	0.00333	8	2

Independent Variables *Hypothesis* *Supported/ Not Supported*	**Total Number of Studies K (Cumulat Sample) (N)**	**Unweighted Mean r**	**Unweighted Mean r Confidence Interval (95%)**	**Weighted Mean r**	**Weighted Mean r Confidence Interval (95%)**	**Significance Weighted Mean r**	**Total Variance**	**Sampling Error Variance**	**File Drawer**	
									.05	**.10**
H18 (+) Supported										
Concern *H19 (+) Supported*	4 (989)	0.15960	0.097956 to 0.220026	0.12939	0.067307 to 0.190467	0.00002	0.00305	0.00391	7	2
Education *H20 (+) Supported*	23 (6042)	0.14296	0.118030 to 0.167705	0.14190	0.116969 to 0.166659	0.00000	0.02014	0.00365	43	10
Employment *H21 (+) Not Supported*	9 (1612)	0.03121	-0.018010 to 0.080277	0.01825	-0.030970 to 0.067381	0.23202	0.23202	0.00558		
Finance *H22 (+) Supported*	26 (10872)	0.13454	0.115972 to 0.153016	0.04154	0.022700 to 0.060361	0.00001	0.05384	0.00238		
Gender *H23 (+) Supported*	9 (4818)	-0.01129	-0.039587 to 0.017024	0.05100	0.022728 to 0.079199	0.00020	0.02528	0.00186		
Generous Giver *H24 (+) Supported*	3 (944)	0.12392	0.060384 to 0.186449	0.11160	0.047926 to 0.174361	0.00030	0.00047	0.00310	4	1
Children *H25 (+) Not*	5 (622)	0.02214	-0.057350 to 0.101346	0.03941	-0.040098 to 0.118430	0.16320	0.00220	0.00801		

Independent Variables *Hypothesis* *Supported/ Not Supported*	**Total Number of Studies K (Cumulat Sample) (N)**	**Unweighted Mean r**	**Unweighted Mean r Confidence Interval (95%)**	**Weighted Mean r**	**Weighted Mean r Confidence Interval (95%)**	**Significance Weighted Mean r**	**Total Variance**	**Sampling Error Variance**	**File Drawer**	
									.05	**.10**
Supported										
Importance of Friend's Advice *H26 (-)* *Not Supported*	4 (598)	0.05301	-0.027898 to 0.133232	0.08954	0.008812 to 0.169106	0.01428	0.01489	0.00658	4	
Income *H27 (-)* *Supported*	30 (7753)	-0.06017	-0.082445 to -0.037834	-0.07185	-0.094086 to -0.049544	0.00000	0.02955	0.00383	14	
Involvement *H28 (+)* *Supported*	25 (8186)	0.29780	0.277841 to 0.317502	0.25565	0.235203 to 0.275879	0.00000	0.03444	0.00265	103	39
Marital Status *H29 (+)* *Supported*	5 (1541)	0.10125	0.051374 to 0.150613	0.10235	0.052492 to 0.151708	0.00003	0.00006	0.00318	6	1
News Read *H30 (+)* *Not Supported*	3 (750)	-0.08108	-0.152077 to -0.009261	-0.08108	-0.152077 to –0.009261	0.01319	0.02427	0.00395	2	
Processing Style *H31 (+)* *Supported*	4 (365)	0.34287	0.247757 to 0.431438	0.22209	0.120935 to 0.318674	0.00001	0.02913	0.00987	14	5

Independent Variables *Hypothesis* *Supported/ Not Supported*	**Total Number of Studies K (Cumulat Sample) (N)**	**Unweighted Mean r**	**Unweighted Mean r Confidence Interval (95%)**	**Weighted Mean r**	**Weighted Mean r Confidence Interval (95%)**	**Significance Weighted Mean r**	**Total Variance**	**Sampling Error Variance**	**File Drawer**	
									.05	**.10**
Responsibility *H32 (+)* *Not Supported*	4 (855)	0.04352	-0.023952 to 0.110601	0.06444	-0.002975 to 0.131275	0.02982	0.02681	0.00464	2	
Self Esteem *H33 (+)* *Not Supported*	7 (551)	0.01401	-0.071008 to 0.098823	0.02734	-0.057730 to 0.112008	0.26098	0.00673	0.01269		
Shopping Trips *H34 (+)* *Supported*	5 (1250)	0.11291	0.057556 to 0.167570	0.11291	0.057556 to 0.167570	0.00003	0.02026	0.00390	7	1
Women *H35 (-)* *Supported*	3 (750)	-0.12637	-0.196460 to -0.054987	-0.12637	-0.196460 to -0.054987	0.00026	0.03744	0.00387	5	1
Cost of Search										
Benefits *H36 (+)* *Supported*	7 (3092)	0.27128	0.238209 to 0.303719	0.40167	0.371591 to 0.430903	0.00000	0.04765	0.00152	50	22
Cost *H37 (-)* *Supported*	37 (9264)	-0.04438	-0.064801 to -0.023914	-0.02078	-0.041250 to -0.000300	0.02273	0.03660	0.00399		

Table 9: Range of Observed Effect Sizes of Various Independent Variables (Only cases where K > 3)

Independent Variables	Theory	Total Number of Studies	Range of the Reported Effect Sizes (r)		Total Sample N
			Minimum	Maximum	
Overall		65	-0.878	0.7965	106155
Market Environment					
Dispersion	Cost Risk	10	-0.4	0.54	5666
List Price		3	-0.15	0.393	944
Number	Cost	10	-0.31	0.599	5561
Situational Variables					
Attribute Importance	Utility	3	-0.4537	0.8	317
Durability		3	-0.138	0.7604	854
Product Importance	Individual Difference	4	-0.07	0.3636	2094
Search/ Credence/ Experience		1	0.0901	0.1286	546
Time Pressure	Cost	10	-0.878	0.36	4829
Tracing		1	-0.0355	0.0007	262
Potential Payoff					
Perceived Risk	Individual Difference Cost Benefit Risk	16	-0.3256	0.331	3567

Independent Variables	Theory	Total Number of Studies	Range of the Reported Effect Sizes (r)		Total Sample N
			Minimum	Maximum	
Refund Given		2	0.1418	0.2388	788
Knowledge and Experience					
Knowledge	Cost Inverted-U	16	-0.34	0.5493	12090
Prior Experience	Individual Difference Cost Theory of Buyer Behavior Learning	19	-0.54222	0.52	10360
Individual Difference					
Age	Risk	13	-0.24	0.2519	6118
Anxiety	Cost Problem Recognition Confidence in Responding	15	0.055	0.5251	4821
Bargain Hunter		1	0.0439	0.4389	1427
Belief	Covariation	2	-0.1851	0.041837	1504
Christmas		1	0.1348	0.1512	1153
Concern		1	0.0683	0.2204	989
Education		14	-0.0105	0.6449	6042
Employment	Risk	3	-0.2	0.2609	1612
Finance	Cost Risk	14	-0.3813	0.4318	10872
Gender		7	-0.41	0.37	4818
Generous Giver		1	0.1018	0.1656	944
Children	Risk	3	-0.06	0.13	622

Independent Variables	Theory	Total Number of Studies	Range of the Reported Effect Sizes (r)		Total Sample N
			Minimum	Maximum	
Importance of Friend's Advice		2	-0.12	0.199	598
Income	Risk	19	-0.4098	0.4388	7753
Involvement	Cost Risk	17	-0.174	0.7965	8186
Marital Status		2	0.0968	0.1153	1541
News Read	Risk	1	-0.2	0.14	750
Processing Style	Cost Cognition	4	0.114018	0.5664	365
Responsibility	Risk	2	-0.15	0.21	855
Self Esteem		4	-0.07	0.186	551
Shopping Trips	Risk	1	-0.17	0.21	1250
Women	Risk	1	-0.27	0.15	750
Conflict and Conflict Resolution					
Cost of Search					
Benefits	Risk	7	0.1206	0.604	3092
Cost	Cost Covariation Risk	19	-0.6134	0.5399	9264

Table 9 gives the range of the observed r's for each independent variable as well as the different theoretical frameworks that have been associated with each antecedent variable, in the different studies. For example, theories of Individual Difference, Cost, Buyer Behavior and Learning have been used for the variable "Prior Experience", in different studies. "Involvement" has been examined in the contexts of Cost Theory as well as Risk. Overall, cost and risk are the two most-used frameworks that have been used to examine antecedent variables in the studies we have uncovered.

Table 8 can be seen for the Weighted Mean r, Weighted Mean r (Confidence interval) and the significance level of the findings that are taken into consideration for testing the above-mentioned hypotheses. As can be seen from the results in Table 8, the hypotheses that are not supported are 2, 4, 9, 11, 13, 21, 25, 26, 30, 32 and 33. The other hypotheses are supported. Of the hypotheses that are not supported, 2, 4, 9, 21, 25, 32 and 33 were not supported because of being not significant (p-value > .05). For hypotheses 11 (refund given), 13 prior experience), 26 (importance of friend's advice) and 30 (news read), significant results are found in the opposite direction.

Some of the other predictor variables that emerge from the 65 studies under review are listed in Tables 10. The effect sizes are reported in terms of F, t, r or χ^2. 43 such variables are reported. Most of the findings show significant results, indicating that further examinations of these antecedents in other contexts might be worth the effort. Here, too, cost and risk remain the two leading frameworks that have been used to explain these variables.

Table 10: Effect Sizes of Other Independent Variables (Only cases where K < 3)

Dependent Variable : Depth of Search

Other Independent Variables	Sample Size N	Theory	Findings
Market Environment			
Advertised Product	164		r = -0.11
Change	219		r = 0.32, p < 0.01 r = 0.13, p < 0.01
Identity Shaper	130		t = 2.83, p < 0.006
Situational Variables			
Category Type	43		$F_{(1,38)} = 0.01$, p < 0.05 $F_{(1,38)} = 0.24$, p < 0.05
Complex	32	Inv-U	$\beta = 0.537$
Foreign Manufacturer	164		r = -0.09
IDB	44	Format	$F_{(1,39)} = 4.6$, p < 0.05 $F_{(1,36)} = 3.7$, p < 0.06
Inventory	366		$t_{(251)} = -0.86$
Memory Aid	144 36		$F_{(1,44)} = 3.43$, p < 0.1 $F_{(1,20)} = 3.807$, p < 0.1
Nutrient	180		
Opportunity	500		$t_{(456)} = 4.72$
Priming	385		$F_{(1,310)} = 3.74$, p < 0.05 $F_{(1,310)} = 5.14$, p < 0.05
Quality	164		r = 0.14, p < 0.05
Salesperson	500 164		r = 0.11, p < 0.01 r = -0.3, p < 0.001

Other Independent Variables	Sample Size N	Theory	Findings
Sequence	35	Utility	$r = 0.87$, $p < 0.001$
Simple	32	Inverted-U	
Word / Picture	44 40	Cost	$F_{(1,39)} = 7.1$, $p < 0.05$ $F_{(1,36)} = 1.2$, $p < 0.1$
Potential Payoff			
Consequence	180		
Knowledge and Experience			
Managerial Experience	165		$r = 0.57$, $p < 0.05$
Individual Difference			
Best Choice	164		$r = 0.27$, $p < 0.001$
Brand Loyalty	60	Individual Difference	$\chi^2_{(3)} = 7.12$, $p < 0.06$
Business Attitude			
City Background	250	Risk	
Desire	1056	Cost	
Family Size	407		$t = 0.291$, $p < 0.004$
Generic Buyer	407		$t = -1.72$, $p < 0.087$
Goal Directedness	500		$r = 0.19$
Hofstede			
Individual Difference	223	Risk	$t_{(103)} = 0.291$, $p < 0.004$
Innovativeness	86		$F_{(1,82)} = 17.47$, $p < 0.001$
Intelligence	120	Cost	$r = 0.1643$
Low Compensation	219		$r = 0.28$, $p < 0.05$
Market Maven	343		$r = 0.32$, $p < 0.01$

Other Independent Variables	Sample Size N	Theory	Findings
Motivation Level	60	Individual Difference	$F_{(1,55)} = 8.74$, $p < 0.01$
OSL	223		$t_{(103)} = 1.5$, $p < 0.1$
Perceived Obesity	120	Cost	
Reference	180		
Residence Type	196		
Rigidity	500		$t_{(103)} = 4.35$, $p < 0.06$
Transient	250	Risk	$r = -0.2$, $p < 0.05$
Conflict and Conflict Resolution			
Cost of Search			
Investment Search	343	Risk	$r = 0.43$, $p < 0.01$
Time Available	351		
Trial	136		$F_{(1,130)} = 17.25$, $p < 0.001$
Unfamiliar	265		$r = 0.35$, $p < 0.05$ $r = -0.06$, $p < 0.05$

Homogeneity Tests

A homogeneity test is conducted for each pair-wise relationship to determine if there is overall consistency with-in that population. Each pair-wise relationship is treated as being the representative of a population. Homogeneity test is conducted with study effects successively deleted to identify outliers (a procedure recommended by Hedges and Olkin (1985) pp. 256). Hedges (1982) and Rosenthal and Rubin (1982) propose that statistical tests be used as an aid in deciding whether study outcomes are more variable than would be expected from sampling error alone. If they are not, then there is no basis for searching for moderators. Hunter and Schmidt (1990) provide statistical tests to assess the homogeneity/heterogeneity of the true effect size correlations across studies. Chi-square or Q-statistic is calculated to determine if the population is homogeneous or heterogeneous. If the population is homogeneous, further search for moderators are not undertaken. However, a heterogeneous population might indicate that there are meaningful moderators that might be uncovered.

Homogeneity tests results for most of the relationships considered are presented in Table 11. Note that many of the results are heterogeneous and moderator analyses was carried out for each variable that tested heterogeneous (excepting for those variables that tested heterogeneous but had 4 or less degrees of freedom).

Potential Moderating Effects of Sample Characteristics: Tests of Moderators

The search for moderator variables is suggested as being appropriate by the homogeneity tests. Differences in study characteristics could also contribute to the variance in information search found across these studies. Seven potential moderators are examined to assess their impact on sample homogeneity**: Age, Gender, Education, Respondent Type, Data Collection Method, Product Type** and **Income.**

Table 11: Results of Homogeneity Tests

Independent Variables	Chi-Square Q	df	Homogenous/ Heterogeneous
Overall	5487.11548	373	Heterogeneous
Market Environment			
Dispersion	304.89950	20	Heterogeneous
List Price	16.95435	4	Heterogeneous
Number	487.64499	16	Heterogeneous
Situational Variables			
Attribute Importance	95.29231	2	Heterogeneous
Durability	91.16197	4	Heterogeneous
Product Importance	11.50937	7	Homogenous
Search/ Credence/ Experience	0.13994	2	Homogenous
Time Pressure	283.12678	20	Heterogeneous
Tracing	0.05847	2	Homogenous
Potential Payoff			
Perceived Risk	34.63463	15	Heterogeneous
Refund Given	1.77791	3	Homogenous
Knowledge and Experience			
Knowledge	362.93414	42	Heterogeneous
Prior Experience	432.62410	35	Heterogeneous
Individual Difference			
Age	117.44173	22	Heterogeneous
Anxiety	67.84410	21	Heterogeneous
Belief	15.96823	8	Heterogeneous
Bargain Hunter	8.34771	5	Homogenous

Independent Variables	**Chi-Square** Q	**df**	**Homogenous/ Heterogeneous**
Christmas	0.03208	3	Homogenous
Concern	3.12196	3	Homogenous
Education	167.72178	22	Heterogeneous
Employment	42.21960	8	Heterogeneous
Finance	587.35551	25	Heterogeneous
Gender	122.42158	8	Heterogeneous
Generous Giver	0.45315	2	Homogenous
Have Children	1.37559	4	Homogenous
Importance of Friend's Advice	9.04849	3	Heterogeneous
Income	231.45001	29	Heterogeneous
Involvement	322.71969	24	Heterogeneous
Marital Status	0.09640	4	Homogenous
News Read	18.44291	2	Heterogeneous
Processing Style	11.76592	3	Heterogeneous
Responsibility	23.11678	3	Heterogeneous
Self Esteem	3.71251	6	Homogenous
Shopping Trips	25.98063	4	Heterogeneous
Women	28.99564	2	Heterogeneous
Conflict and Conflict Resolution			
Cost of Search			
Benefits	209.48076	6	Heterogeneous
Cost	339.36084	36	Heterogeneous

For all reported moderator analyses, the following are applicable:

- An initial analysis for the moderators (for each variable) was carried out on SPSS 10.0. A regression analysis is undertaken for each variable to determine the significant moderators.
- The standard error figure(s) (in the subsequent tables) were corrected and the final tables were created using DSTAT 1.11.
- All p's are two-tailed.

Table 12 gives the results of moderator analysis for the overall study. All the moderators are found as being significant. All the moderators are also significant for variables Prior Experience and Time Pressure (Table 28 and 29). None of the moderators are significant for the variable Knowledge (Table 25), which might mean that there might be other potential moderators that might be worth exploring. Perceived Risk (Table 27) has only one of the moderators, *gender*, that is significant. This might suggest that males and females vary in their perception of risk.

A close examination of the other tables show that **Age**, **Gender**, **Product Type** and **Income** are significant moderators of almost all of the variables examined. **Respondent Type** is also found to be significant on several occasions. Interactions are not considered here. The issue of adaptation of scales from other studies pose a threat to validity. In case of such studies, the ate

nuation factor is calculated and taken into account while calculating the effect size. Next, we suggest a baseline model of information search, and another model based on the baseline model, which is specific to the Internet.

Table 12: Test of Regression Model Specification: ALL

Predictor	B	Std. Error	Z-value	P
Age	+3.5620000	0.0016430	2167.91968	0.00000
Gender	-1.3970000	0.0016368	-853.49481	0.00000
Educat	-1.0280000	0.0016329	-629.55750	0.00000
RespType	+4.9879999	0.0117447	424.70148	0.00000
DataColl	-7.9489999	0.0112302	-707.82092	0.00000
ProdType	+19.8320007	0.0043350	4574.87744	0.00000
Income	+0.4170000	0.0017098	243.88106	0.00000

Overall regression effect = 2.095362E+07 , df = 7 , p = 0.000000.
Test of model specification (Q-E) = 2.31E+08 , df = 369 , p = 0.000000.

Table 13: Test of Regression Model Specification: AGE

Predictor	B	Std. Error	Z-value	P
Gender	-0.0454000	0.0124669	-3.64164	0.00027
Educat	-0.0062730	0.0114280	-0.54892	0.58306
DataColl	-0.1200000	0.1111632	-1.07949	0.28037
ProdType	-0.0796000	0.0150642	-5.28406	0.00000
Income	-0.0249400	0.0083113	-3.00075	0.00269

Overall regression effect = 56.507 , df = 5 , p = 0.000000.
Test of model specification (Q-E) = 63.006 , df = 17 , p = 0.000000.

Table 14: Test of Regression Model Specification: ANXIETY

Predictor	B	Std. Error	Z-value	P
Age	-0.0025880	0.0075513	-0.34272	0.73181
Gender	-0.0285800	0.0144161	-1.98251	0.04742
ProdType	-0.0840000	0.0302051	-2.78099	0.00542

Overall regression effect = 11.732 , df = 3 , p = 0.008360.
Test of model specification (Q-E) = 23.339 , df = 10 , p = 0.009562.

Table 15: Test of Regression Model Specification: BELIEF

Predictor	B	Std. Error	Z-value	P
Income	-0.0260000	0.0048179	-5.39649	0.00000

Overall regression effect = 15.547 , df = 1 , p = 0.000081.
Test of model specification (Q-E) = .302 , df = 7 , p = 0.999898.

Table 16: Test of Regression Model Specification: BENEFITS

Predictor	B	Std. Error	Z-value	P
Gender	-0.0107000	0.0139238	-0.76847	0.44221
Educat	+0.0471100	0.0125315	3.75934	0.00017
ProdType	-0.1090000	0.0501259	-2.17453	0.02967

Overall regression effect = 166.038 , df = 3 , p = 0.000000.
Test of model specification (Q-E) = 38.685 , df = 3 , p = 0.000000.

Table 17: Test of Regression Model Specification: COST

Predictor	B	Std. Error	Z-value	P
Age	+0.0022030	0.0054891	0.40134	0.68817
Gender	-0.0089700	0.0066654	-1.34576	0.17838
Educat	+0.0030990	0.0062733	0.49400	0.62131
RespType	+0.2690000	0.0443052	6.07152	0.00000
DataColl	-0.1050000	0.0376398	-2.78960	0.00528
ProdType	+0.1750000	0.0215645	8.11520	0.00000
Income	+0.0343000	0.0062733	5.46761	0.00000

Overall regression effect = 186.748 , df = 7 , p = 0.000000.
Test of model specification (Q-E) = 188.651 , df = 29 , p = 0.000000.

Table 18: Test of Regression Model Specification: DISPERSION

Predictor	B	Std. Error	Z-value	P
Age	-0.1500000	0.0883019	-1.69872	0.08937
Gender	+0.2790000	0.1403270	1.98821	0.04679
RespType	+1.2260000	0.5852113	2.09497	0.03617
DataColl	+0.1520000	0.1543878	0.98453	0.32485
ProdType	+0.0193000	0.0939263	0.20548	0.83720
Income	-0.0547000	0.0326211	-1.67683	0.09358

Overall regression effect = 137.987 , df = 6 , p = 0.000000.
Test of model specification (Q-E) = 177.031 , df = 14 , p = 0.000000.

Table 19: Test of Regression Model Specification: EDUCATION

Predictor	B	Std. Error	Z-value	P
Age	+0.5740000	0.0078158	73.44143	0.00000
Gender	-100.1399994	0.0443330	-2258.81226	0.00000
Educat	+96.6330032	0.0330498	2923.85693	0.00000
ProdType	+90.4540024	0.0161826	5589.58740	0.00000
Income	+25.9759998	0.0089002	2918.58984	0.00000

Overall regression effect = 1.32E+07 , df = 5 , p = 0.000000.
Test of model specification (Q-E) = 4.78E+07 , df = 17 , p = 0.000000.

Table 20: Test of Regression Model Specification: EMPLOYMENT

Predictor	B	Std. Error	Z-value	P
Educat	+0.0023910	0.0121385	0.19698	0.84385
ProdType	-0.1330000	0.0277452	-4.79362	0.00000

Overall regression effect = 24.52 , df = 2 , p = 0.000005.
Test of model specification (Q-E) = 17.96 , df = 6 , p = 0.006333.

Table 21: Test of Regression Model Specification: FINANCE

Predictor	B	Std. Error	Z-value	P
Age	+0.0127200	0.0091190	1.39490	0.16305
Gender	-0.1930000	0.0482292	-4.00173	0.00006
Educat	+0.0555500	0.0585640	0.94854	0.34286
RespType	+0.7440000	0.4125822	1.80328	0.07134
DataColl	-0.6730000	0.4123796	-1.63199	0.10268
ProdType	+0.1210000	0.0295860	4.08978	0.00004
Income	+0.0958400	0.0255331	3.75356	0.00017

Overall regression effect = 191.822 , df = 7 , p = 0.000000.
Test of model specification (Q-E) = 438.338 , df = 18 , p = 0.000000.

Table 22: Test of Regression Model Specification: GENDER

Predictor	B	Std. Error	Z-value	P
Age	+0.0704400	0.0174973	4.02575	0.00006
Gender	-0.0562000	0.0181149	-3.10242	0.00192
ProdType	+0.2070000	0.0876926	2.36052	0.01825
Income	-0.0537000	0.0158505	-3.38790	0.00070

Overall regression effect = 37.274 , df = 4 , p = 0.000000.
Test of model specification (Q-E) = 94.395 , df = 4 , p = 0.000000.

Table 23: Test of Regression Model Specification: INCOME

Predictor	B	Std. Error	Z-value	P
Age	+0.0548500	0.0172443	3.18077	0.00147
Gender	-0.1210000	0.0214502	-5.64098	0.00000
Educat	+0.0580900	0.0201884	2.87740	0.00401
RespType	+0.6780000	0.2128193	3.18580	0.00144
DataColl	-0.6130000	0.1341687	-4.56887	0.00000
ProdType	+0.0009243	0.0210296	0.04395	0.96494
Income	-0.0182000	0.0155619	-1.16952	0.24219

Overall regression effect = 116.709 , df = 7 , p = 0.000000.
Test of model specification (Q-E) = 124.358 , df = 22 , p = 0.000000.

Table 24: Test of Regression Model Specification: INVOLVEMENT

Predictor	B	Std. Error	Z-value	P
Age	+0.4930000	0.0694539	7.09823	0.00000
Gender	-0.0606000	0.0072815	-8.32251	0.00000
Educat	-0.3910000	0.0756151	-5.17092	0.00000
RespType	-0.7920000	0.1036207	-7.64326	0.00000
DataColl	-0.0950000	0.0974595	-0.97476	0.32968
ProdType	-0.0414000	0.0246449	-1.67986	0.09298
Income	-0.0409000	0.0137227	-2.98045	0.00288

Overall regression effect = 174.672 , df = 7 , p = 0.000000.
Test of model specification (Q-E) = 216.754 , df = 17 , p = 0.000000.

Table 25: Test of Regression Model Specification: KNOWLEDGE

Predictor	B	Std. Error	Z-value	P
Age	-0.0172000	0.0121127	-1.41999	0.15561
Gender	+0.0103300	0.0092439	1.11749	0.26378
Educat	-0.0188000	0.0168941	-1.11282	0.26579
RespType	+0.0589800	0.1450340	0.40666	0.68425
DataColl	-0.0770000	0.0908455	-0.84759	0.39666
ProdType	-0.0330000	0.0408008	-0.80881	0.41863
Income	+0.0115200	0.0229504	0.50195	0.61570

Overall regression effect = 59.357 , df = 7 , p = 0.000000.

- Test of model specification (Q-E) = 334.622 , df = 35 , p = 0.000000.

Table 26: Test of Regression Model Specification: NUMBER

Predictor	B	Std. Error	Z-value	P
Educat	+0.0213600	0.0072844	2.93230	0.00336
DataColl	-0.2700000	0.0969822	-2.78402	0.00537
ProdType	-0.0213000	0.0182824	-1.16506	0.24400
Income	-0.0171000	0.0122835	-1.39212	0.16389

Overall regression effect = 12.809 , df = 4 , p = 0.012248.
Test of model specification (Q-E) = 539.194 , df = 12 , p = 0.000000.

Table 27: Test of Regression Model Specification: PERCEIVED RISK

Predictor	B	Std. Error	Z-value	P
Age	-0.0153000	0.1232246	-0.12416	0.90119
Gender	+0.0300000	0.0140028	2.14243	0.03216
Educat	-0.0128000	0.1358272	-0.09424	0.92492
RespType	-0.0822000	0.1330266	-0.61792	0.53663
DataColl	+0.1100000	0.1582316	0.69518	0.48694
ProdType	-0.1320000	0.1736347	-0.76022	0.44713
Income	+0.0110100	0.0518104	0.21251	0.83171

Overall regression effect = 9.797 , df = 7 , p = 0.200372.
Test of model specification (Q-E) = 3.059 , df = 6 , p = 0.801406.

Table 28: Test of Regression Model Specification: PRIOR EXPERIENCE

Predictor	B	Std. Error	Z-value	P
Age	+21.3670006	0.0178395	1197.73303	0.00000
Gender	-18.0119991	0.0095370	-1888.64404	0.00000
Educat	-12.5539999	0.0069664	-1802.08984	0.00000
RespType	+1.5549999	0.0983338	15.81349	0.00000
DataColl	-70.4639969	0.0797671	-883.37207	0.00000
ProdType	+88.9209976	0.0446011	1993.69458	0.00000
Income	-4.5380001	0.0165103	-274.85880	0.00000

Overall regression effect = 1.984739E+07 , df = 7 , p = 0.000000.
Test of model specification (Q-E) = 1.63E+08 , df = 26 , p = 0.000000.

Table 29: Test of Regression Model Specification: TIME PRESSURE

Predictor	B	Std. Error	Z-value	P
Age	+0.0215800	0.0074262	2.90591	0.00366
Gender	+0.3510000	0.0286441	12.25384	0.00000
Educat	+0.2390000	0.0233396	10.24009	0.00000
RespType	-1.5580000	0.1580729	-9.85621	0.00000
DataColl	-1.5420001	0.1479945	-10.41931	0.00000
Income	-0.5490000	0.0456184	-12.03463	0.00000

Overall regression effect = 242.205 , df = 6 , p = 0.000000.
Test of model specification (Q-E) = 49.759 , df = 14 , p = 0.000002.

Meta-Analysis: Conclusion

In addition to the variables included in the meta-analysis ($K^{10}>3$ – See table 9), a search of the information search literature also yield other variables that have not been frequently explored ($K<3$ – See table 10). Some of the infrequently explored variables ($K<3$) might be explored in future studies. For example, it would be interesting to see how "brand loyalty" affects information search behavior, OR whether there is an increase or a decrease in the information search undertaken for an "advertised product". Therefore, the meta-analysis identifies opportunities for further explorations and provides future research directions.

In conclusion, the meta-analysis indicates that quite a few variables (e.g., price dispersion, number of alternatives, time pressure) show significant effect sizes in their relationship with information search. However, there are other variables (e.g., self esteem) that do not display significant effect sizes. Four significant moderators (age, gender, product type and income) are identified. As a result, we suggest a baseline model that includes the variables that are identified and found significant in the meta-analysis.

BASELINE MODEL: MODEL 1

A conceptual model (Figure 2) for consumer information search behavior is formulated based on our findings from the meta-analysis on traditional information search literature presented in the previous section. The model (subsequently referred to as Model 1) can be treated as baseline model for online information search. The dependent variable in Model 1 is "depth of search" (which is the total amount of search conducted *offline*). Those variables that are found to be significant in the meta-analysis, are taken into consideration when suggesting this model. Those variables that are not significant, are not included in Model 1.

[10] Recall that K = Number of studies in which a particular antecedent variable occurs

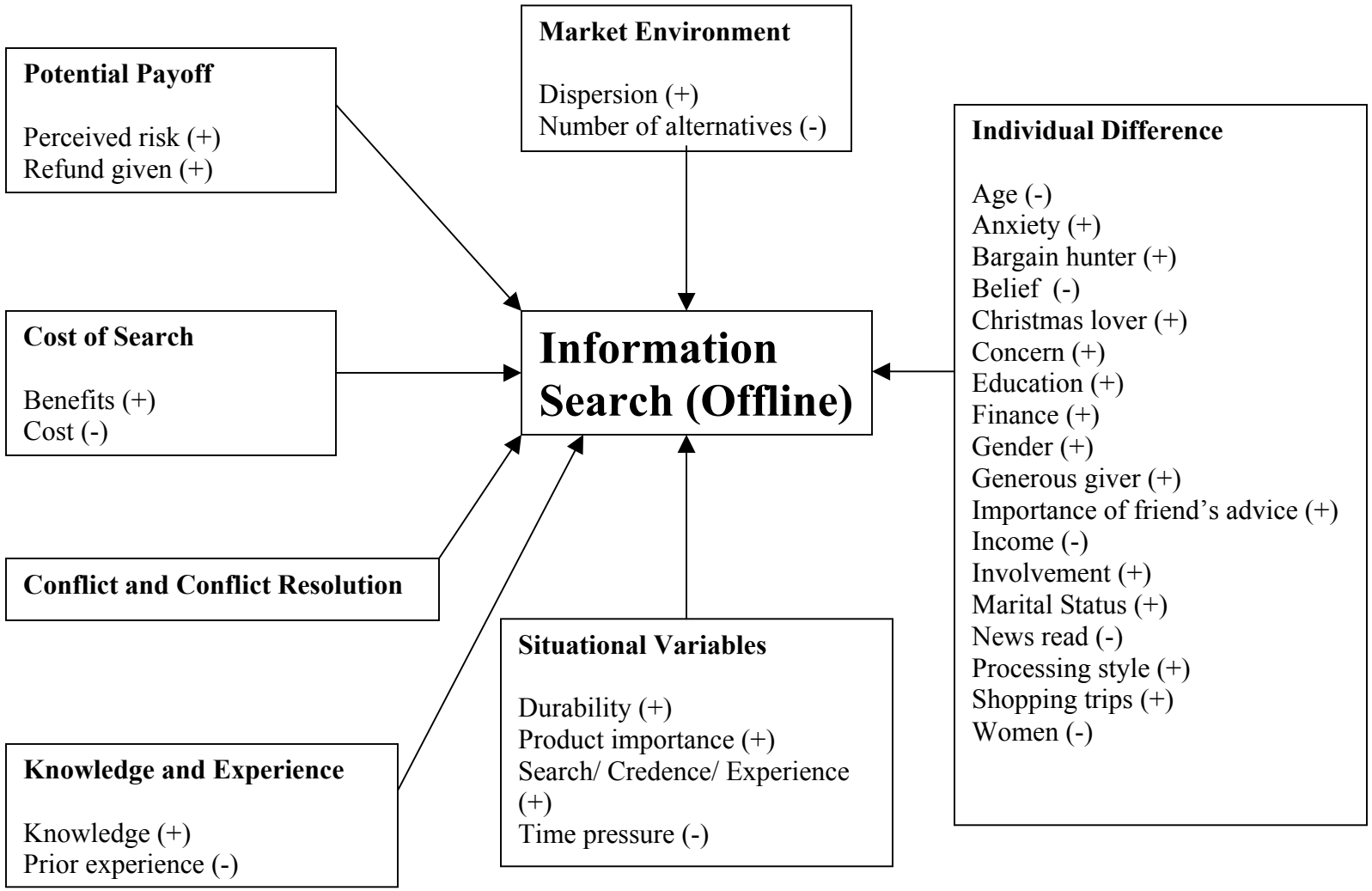


Figure 2: Model of Offline Information Search (Variables that are found as being significant in the Meta-Analysis)

Differences: Online and Offline Search

In this section we discuss differences among how consumers search for information in the offline and online environments. Characteristics that are exclusive to online information search are identified in Table 30, and are based on our current knowledge of online information search based on extant e-commerce literature. These characteristics, along with the variables presented in Model 1[11], serve as the basis for a second (competing) model (subsequently referred to as Model 2 – see Figure 3) built specifically to explain search behavior on the Internet, which is discussed next.

MODEL FOR ONLINE INFORMATION SEARCH: MODEL 2

Conceptual Framework

In this section, we develop a model of information search behavior for the online environment based on extant e-commerce literature. In Model 2, we specifically concentrate on information search in the online environment. Information search (online) is defined as the total amount of search on the Internet. Searching involves all product-relevant information before making a choice/decision/transaction. The dependent variable here, as in Model 1, is "depth of search" (which is the total amount of search conducted *online*). The model is designed for the B-to-C information search context. Further, the model assumes that consumers have prior online experiences and are willing to access the Internet to search for information.

[11] Note that in addition to the characteristics identified in Table 30, the antecedent variables identified in Model 1 (search behavior in the offline environment) also apply to Model 2 (search behavior in the online environment). However, those variables that are already discussed for Model 1 are not discussed again for the sake of avoiding repetition.

Table 30: Differences Between Offline and Online Consumer Information Search Behavior

Offline Information Search Behavior	Online Information Search Behavior
Market Environment	**24-hour Availability, No Travel**
Situational Variables	**Interactivity, Ease of Use, Website Design (Interface and Graphics Quality)**
Individual Difference	**Positive Attitude towards Technology, Site Satisfaction, Entertainment Motive**
Knowledge and Experience	**Years on the Internet**
Potential Payoff	**Price Dispersion**
Conflict and Conflict Resolution	**Return Policy, FAQs**
Cost of Search	**Decision Aids, Security (Privacy Policy)**

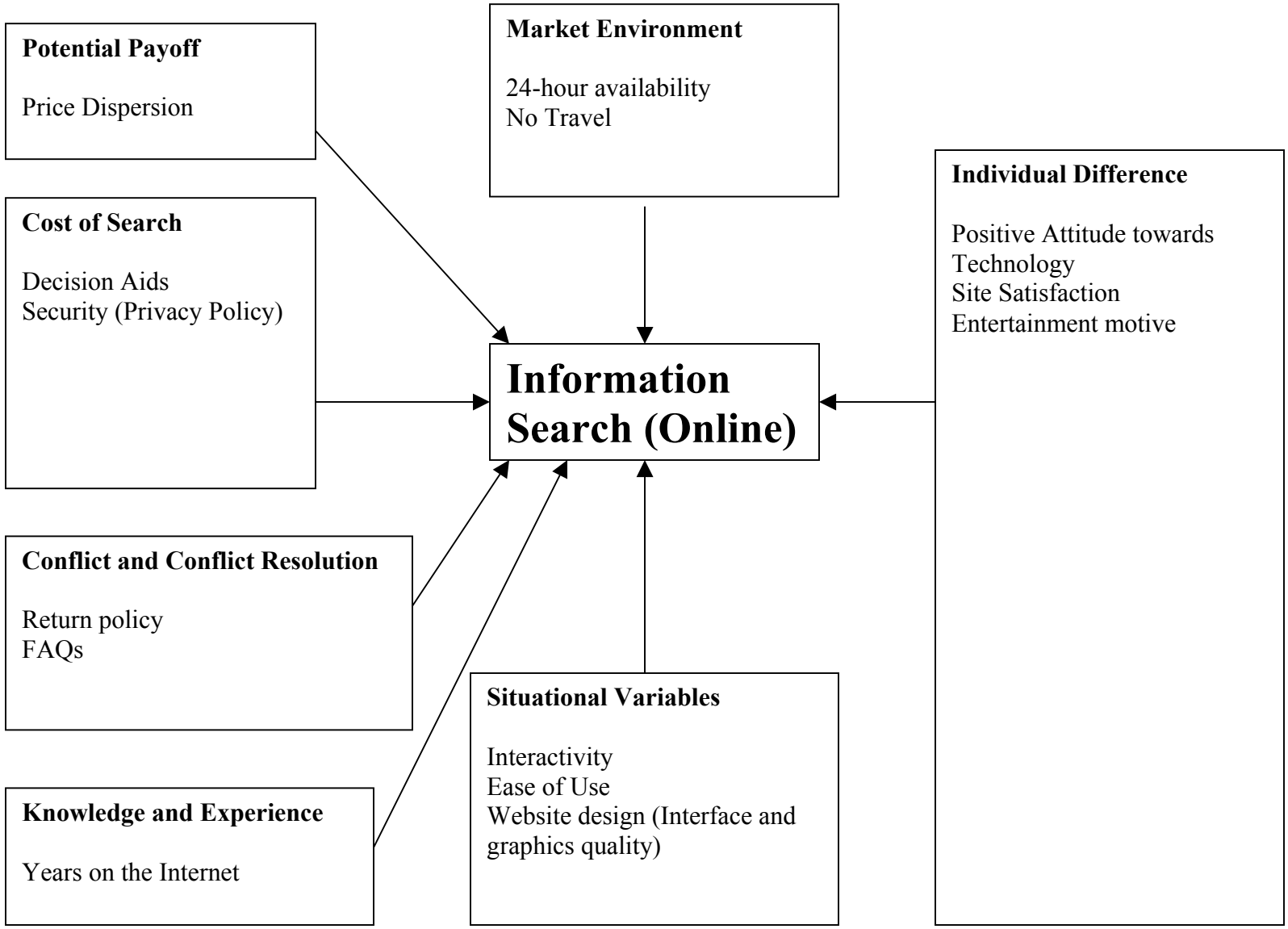


Figure 3: Model of Online Information Search

Variables for Model 2 are identified from extant e-commerce literature[12]. The variables identified in Model 2, as those in Model 1, fit into the seven categories of variables previously discussed. Each variable is examined and a proposition regarding the direction of the relationship of this variable with information search is made based on our reading of extant e-commerce literature. In other words, the findings in e-commerce literature, in general, are extended to the realm of online information search behavior. The propositions apply to specific Websites and/or the Internet as a whole, as the case may be.

Market Environment

24-hour Accessibility: Product availability and the ease of comparison shopping relate closely to Internet commerce (Torkzadeh and Dhillon 2002). The ease and convenience of shopping from home at any time of day or night is an appealing allurement for shoppers in virtual reality (Donthu and Garcia 1999; Pastore 2000). In addition, the availability of "24-hour shopping" is a bonus. This unique feature affects information search behavior. We propose that:

P1: The greater the accessibility of a Website, the greater will be the amount of information search undertaken on the Internet. (+)

No Travel: Some Internet users prefer online shopping over in-store shopping because of its convenience and the consumers who value convenience are more likely to search for information over the Internet (Li et al. 1999). "Shopping travel" is perceived as an important factor affecting whether consumers visit a specific shop (Torkzadeh and Dhillon 2002). Online shoppers enjoy their increased sense of control in the cyberstore compared to other purchase situations. The Web allows people to shop at stores not available in their geographic area

[12] The variables that are suggested in the competing model, are in addition to the variables that are already explored in the meta-analysis.

(Edenkamp and Czark 2000). This adds to the comfort and ease of shopping and information search. Therefore:

P2: The lesser the shopping trips involved, the greater the amount of information search undertaken on the Internet. (+)

Situational Variables

Interactivity: Alba and Hutchinson (1999) suggest that interactivity is the hallmark of new media. The Internet, a new medium, is two-sided – i.e., it provides scope for transactions and feedbacks. It obviates the need of sales personnel. Real-time customer service (an interactive tool), which is rapidly becoming the standard on-line (Burke and McCann, 2000), is an example of the interactive nature of the Internet. The ability of a knowledge agent to talk users through their purchases, and generally help them to find what they are looking for, somewhat personalizes the user experience. This is akin to the help obtained from a sales person in an actual store. These are some of the benefits obtainable over the Internet.

The interactive element of the Web puts the users in charge of the medium (Korgaonkar and Wolin 1999) as well as the transaction. It empowers the consumer. According to Hoffman and Novak's (1999) model, the interactivity feature of a Website is postulated as an antecedent of flow experience. We propose that:

P3: The greater the interactivity, the greater the amount of information search undertaken on the Internet. (+)

Ease of Use: Marketing literature identifies that the ease of access to information sources is an important situational variable that contributes directly to external search effort (Beatty and Smith 1987). This is similar to the "ease of use" construct found in the management information system literature (Davis 1989). Navigation through a Website must feel natural and should be

easy to learn (Moschella 1998). Ease of usage of Websites contributes positively towards how one feels about the Website. Therefore, it is proposed that:

P4: The greater the ease of use, the greater is the amount of information search undertaken on the Internet. (+)

Website design (Interface and graphics quality): Five general categories of Website quality arose from a literature review and exploratory research: ease of use, usefulness, entertainment, complementary relationship, and customer service. These categories contain specific dimensions and instruments for measuring Website quality[13] (Loiacono 2002). All of these dimensions together affect the perception of Website quality. Thus:

P5: The better the Website design, the greater the amount of information search undertaken on the Internet. (+)

Potential Payoff

Price Dispersion: Researchers have been puzzled by the existence of substantial price dispersion on the Internet. Even though prices might be lower at some Websites, as compared to other Web stores, it is not always true that consumers are looking for the lowest possible price (Johnson, et al 2004). Vendor trust and prior experience affect the search process. Lack of search is consistent with price dispersion. Therefore, we propose:

P6: Price dispersion decreases the amount of information search undertaken on the Internet. (-)

Knowledge and Experience

Years on the Internet: Johnson, et al. (2004) suggest that people tend to visit few stores online despite the fact that consumers are "just a mouse click away" from other stores. Though browsing behavior vary by product category and level of activity, no increase with experience on the Internet is observed (Johnson, et al, 2004). While more-active shoppers tend to visit more

[13] WebQual™ (Loiacono et al 2002)

sites in any given month, there is no evidence that experience increases the number of sites visited. Thereofre:

P7: Prior experience on the Internet does not affect the amount of information search undertaken on the Internet.

Individual Difference

Positive Attitude towards Technology: Positive attitude towards technology is defined as the positive disposition towards the adoption of new technology. The attitude towards new technology systems is such that, and most market participants recognize the increase in the possible benefits that can be reaped (Boisvert 2001). This can be seen as being reflected in variety-seeking behavior. Variety-seeking behavior usually implies some degree of risk taking on the part of the consumer (i.e., the risk that a new Website will adequately fulfill the need). Therefore, those displaying a positive attitude towards the Internet, will be found to be engaging in more search on the Internet.

P8: Positive attitude towards technology increases amount of information search undertaken on the Internet. (+)

Site Satisfaction: From a broad perspective, the Internet is a new technology and Website satisfaction is driven by ease of use and usefulness (Davis 1989). Davis argue that these two concepts are predominant in predicting how much consumers will be using computer technologies. The ability to easily navigate a Website and its perceived value (e.g. entertainment, convenience, community) influence both usage level and satisfaction (Davis 1989). Yoon (2002) suggests transaction security is the most important antecedent of online purchase intention with a mediator of trust or Website satisfaction. By extension, satisfaction in the online environment may also be driven by consumer benefits in using self-service technologies. As noted by van Kiel et al (2001), these benefits include convenience (Meuter et al, 2000; Reichheld and Schefter

2000; Szymanski and Hise 2000), saving time and money (Meuter et al, 2000), avoiding interpersonal interaction (Dabholkar 1996), and being in control (Zeithaml et al, 2000). This implies that the drivers of Web satisfaction may include Website characteristics (e.g. ease of use), the specific Website's value (e.g. useful information), and its relative value (e.g. more convenient than offline shopping). We therefore propose:

P9: The greater the site satisfaction, the greater is the amount of information search undertaken on the Internet. (+)

Entertainment motive: Following Davis, Bagozzi, and Warshaw's (1989; 1992) works, Hoffman and Novak (1996) used two concepts from motivational literature – extrinsic and intrinsic motivation – to explain their effects on navigation behavior. Extrinsic motivation refers to goal-oriented activities performed to achieve intended outcomes, whereas intrinsic motivation refers to "autotelic" and experiential activities. While consumers with extrinsic motivation used Internet advertising to perform specific tasks (e.g., to purchase products, or obtain product knowledge), those with intrinsic motivation were likely to click on Internet advertising for entertainment and relaxation purposes. The "Entertainment" motive was found to predict whether consumers spent more time online. Therefore, we suggest:

P10: The greater the entertainment motive, the greater the amount of information search undertaken on the Internet. (+)

Conflict and Conflict Resolution

Return Policy: Like in traditional business, product guarantees offered by Web firms are powerful tools for gaining competitive advantages, raising the level of customer trust and reducing the online transaction anxiety. Eroglu et al. (2001) propose that there are online environmental cues that lead to affective and cognitive internal states, which then result in approach/avoidance behaviors. Examples of high task-relevant cues are descriptions of the

merchandise, the price, terms of sale, delivery and return policies, pictures of the merchandise, and navigation aids to facilitate movement through the site (e.g., site map, frames). Clear policies outlining product returning procedures and compensation in case of dissatisfaction with the product have been found to have a positive effect on online vendors' credibility (Constantinides 2004). The presence of such cues assure consumers and decrease the amount of search undertaken. Therefore we propose that:

P11: The presence of a return policy decreases the amount of information search undertaken on the Internet. (-)

FAQs: Components of uncertainty reducing elements are "frequently asked questions" (FAQs) and conflict-resolution policies. Allowing easy access of online customers to this type of information enhances trust but also reduces the number of inquiries of customers with questions on such issues. These are important contributing factor for choosing a specific Website and the Internet for carrying out transactions (Torkzadeh and Dhillon 2002). We propose that:

P12: The presence of FAQs decrease the amount of information search undertaken on the Internet. (-)

Cost of Search

Decision aids: A variety of decision aids (e.g., search function, smart agents, shopbots) are increasingly being made available at Websites to aid consumer decision-making. For example, smart agents are mechanisms that can affect cost of search because of changes in ongoing usage costs (Zauberman 2003). Smith (2002) observes that shopping bots (shopbots) significantly affect prices: prices fall faster among demographic groups with high Internet use. To the extent that shopbots lower customer search costs, one might expect to also see lower prices. Therefore, the Internet facilitates comparison shopping and speeds up the finding of an item, resulting in lower information search. Therefore, we propose that:

P13: The presence of decision aids decreases the amount of information search undertaken on the Internet. (-)

Security (Privacy Policy): Identity theft issues and overall security concerns play important roles in online consumer information search behavior, which has an impact on consumer trust. According to categorization theory (Mervis and Rosch 1981), when an individual holds general attitudes toward a store type (e.g., e-tailers), those attitudes are readily accessible and likely to affect the individual's store-specific quality perceptions and store-specific attitudes (Bauer and Greyser 1968; Darley and Lim 1993; MacKenzie and Lutz 1989). Thus, store-type evaluation may influence evaluation about a particular store that falls into that category. Therefore, an e-store's security/privacy policy have a large impact on online shoppers' trust in the store, and therefore will influence their purchase decisions. Based on the afore-mentioned argument, we offer the following proposition:

P14: The presence of a privacy policy decreases the amount of information search undertaken. (-)

Conclusion

Model 1 provides a better understanding of information search in the offline environment, while Model 2 helps us better understand information search in the online environment. As previously mentioned, the variables affecting online information search behavior include the variables identified in Model 1. However, these specific antecedents are not explicitly mentioned in the figure describing Model 2 (Figure 3), lest it be repetitive. Model 2 specifically identifies the antecedents to online information search and the above discussion offers a series of propositions for each of those variables. It would be interesting to compare online information search versus offline information search on the dimensions suggested here. The outcome of such an exploration will contribute towards the debate on whether online

consumer behavior is unique, or whether it is an extension of consumer behavior in the traditional channels.

DISCUSSION

Summary

This study aims to provide a broad view of information search, incorporating a wide variety of predictors. A meta-analysis is conducted on offline information search and two models of information search behavior are proposed: Model 1 explores offline search and Model 2 explores online search. There are similarities between the two models. For instance, all the antecedents appearing in Model 1 are included in Model 2[14]. Moreover, the seven categories of variables that are suggested by Beatty and Smith (1984) in the context of traditional information search (Model 1) also hold true for information search variables identified in Model 2.

The Internet is evolving rapidly. This ever-changing nature of the Internet presents some challenges to e-commerce researchers. Any work on Internet-related issues seems to be an effortful attempt to capture a moving target. Therefore, caution should be exercised when interpreting the model (for online information search) proposed in the current study. Some explanatory variables (e.g., positive attitude towards technology) are time dependent. We might not be far off from when these propositions might no longer true for the generic online search behavior. People's confidence in using different Web applications, for instance, will be moving on to newer generations of options and services enabled by technological advances.

Managerial Implications

It is generally agreed that e-tailing is a good supplement to, but not a complete replacement for bricks-and-mortar retailing. Though e-tailing is expected to expand in economic

[14] Even though the variables appearing in Model 1 do not explicitly appear in Model 2, they are variables that also affect information search in the online environment (Model 2).

importance, traditional retail formats are still here to stay. Therefore, research in this area is much needed in order to understand hybrid business models (e.g., part offline strategy and part online strategy). Despite rapid adoption of the Internet as a source of information, much is yet to be learned about consumers' search behavior. The Internet can function as a communication channel as well as a retailing outlet. By focusing on the information search aspects of the new medium, the current study investigates issues that are of great interest to marketing managers. We suggest a profile of online searchers. For instance, Internet information searchers tend to be less risk averse. Information search behavior has implications for the kind of information that should be made available on the Internet versus the kind of information that might be best disseminated through other communication channels. Similar implications hold for advertising issues.

Theoretical Contributions

Theories that are used (in extant literature) to explain consumer information search behavior (offline) are uncovered through the search for pertinent studies for the meta-analysis. Referring to Table 9 (above) please note that a variety of theories (e.g., cost theory, risk theory, utility theory, individual difference, theory of buyer behavior) are used to explain the relationships between individual antecedent variables and information search. However, the two most often used theoretical frameworks in this context are cost and risk theories. Sometimes both these theories are used in explaining the same antecedent variable (e.g., price dispersion, involvement).

The application of two specific theories for explaining the same phenomena open up opportunities for framing and exploring competing hypotheses. Future studies can be undertaken to examine which of these theories really hold. Taking cue from the meta-analysis, we use these

two theoretical frameworks in two subsequent experiments that we design to test competing hypotheses.

The meta-analysis also leads to the formulating of Model 1 (Figure 2). Only those antecedent variables that display significant effect sizes are included in the first model. Further, through Model 2 (Figure 3) a variety of propositions are made that explain information search behavior on the Web. The second model is derived from extant research in e-commerce literature. One of our main contributions is making a connection between offline information search theory and online search behavior. By introducing the second model, we seek to contribute towards an unexplored link missing in the current E-commerce research on online information search. We argue that an exploration of offline search behaviors make a logical starting point for understanding offline search behavior. Further research can be devoted to designing empirical studies to test the conceptual models. Actual search data from potential consumers browsing online can be collected to test the models and their corresponding hypotheses. We don't explicitly explore interaction effects in this paper. Future researchers may want to explore interactions and their consequences.

Limitations

One of the limitations of this study results from the width of the predictors. It is difficult, if not impossible, to test the entire conceptual models in one empirical study. This is very often a born problem for many holistic typologies. Nonetheless, the two sets of proposed models can lead to a plethora of research opportunities. Future empirical research may be designed to test a component of the models.

Despite our effort to locate unpublished studies for the meta-analysis, not many unpublished works were found. This could bias the effect size estimates towards more significant

results. The file drawer N's calculated in our study provide some estimates for the number of studies showing non-significant results required to nullify the significant results.

The error of measurement in the variables reduces effect-size estimates. If the reliability of measurement is low, the reduction can be quite sizeable. Furthermore, variation in reliability across studies causes variation in the observed effect sizes above and beyond that produced by sampling error. If the true effect size is actually homogeneous across studies, the variation in reliability would produce false impression of heterogeneity (Hunter and Schmidt 1990). Many of the 65 individual studies (especially those published long time ago) that we analyzed didn't report reliability measures. This could lead to systematic reduction in the mean effect size.

SUMMARY OF UPCOMING CHAPTER

The next chapter presents the second part of the study, comprising three laboratory experiments, where we concentrate on exploring the specific effects of two manipulated factors – namely *mode of search* and *task type* – on information search. The experiments are designed to help us explore search behavior in the different modes of search (e.g., in-store, e-commerce, m-commerce).

CHAPTER 3

TWO LAB EXPERIMENTS

The extensive literature search that has been undertaken during the course of the meta-analysis, leads us to believe that there has been limited exploration of information search behavior in different media (e.g., in-store, electronic commerce OR e-commerce, mobile commerce OR m-commerce) within the same study. Consumers search for information in a variety of channels. Further, there has been an increased incorporation of a wide range of technical devices (e.g., cell phone, palm digital assistant OR "PDA") which are being used to satisfy this need for information search. It would, therefore, be timely and informative to undertake a study which investigates the information search behavior of consumers in various modes of search.

Two[15] experiments are designed to study how consumers conduct different types of search tasks (*task type*) in various *modes of search* (e.g., In-Store, Internet (Fixed), Internet (Mobile)). The effects of these two independent variables on consumer search behavior and the roles of both internal and external searches are explored. In brief, the overall objective of the two experiments is to develop a better understanding of information search behavior, both in the offline and the online environments. Questions about the "fit" of the mode of search to the search task are also raised.

Of the two experiments, one is a between factors (both factors are between factors) experiment and the other is a mixed-design (*mode*: between factor; *task*: with-in factor)

[15] Experiment one is a larger undertaking than experiment two

experiment. The dependent variables, independent variables, control variable and covariates are the same for the two experiments. As mentioned in Chapter 1, a third study is undertaken that explores what medium is "naturally" preferred for the given tasks. This is referred to as "natural search" in the final sections of the chapter. The third study is discussed after the first two studies.

Dependent Variables

Several dependent variables are measured in the two experiments. These variables represent the four stages of problem-solving (e.g., information search, evaluation of alternatives, purchase/decision and post-purchase behavior) as described in Chapter 1 (see Figure 1). The specific variables are:

1) ***Total Amount of Search*** – defined as the number of brands taken into consideration, the number of alternatives taken into consideration, *and* the number of times a particular source was examined;
2) ***Time Spent on Search*** – defined as the total time required to complete a search task and make a choice;
3) ***Consideration Set*** – defined as the total number of brands or alternatives that a consumer considers making the final choice from to achieve a choice goal;
4) ***Decision Making and Simulated Purchase*** – defined as the brand or option that is finally chosen;
5) ***Satisfaction*** – defined as the satisfaction experienced by the participant upon undertaking a search task on a particular mode;
6) ***Enjoyment*** – defined as the enjoyment experienced by the participant upon undertaking a search task on a particular mode;

7) ***Search Effort*** – defined as the effort that the participant expends in order to undertake a search task on a particular mode;

8) ***Loyalty*** – defined as the possibility of the participant undertaking a specific search task on a particular mode; and

9) ***Word-of-Mouth*** – defined as the nature of word-of-mouth communication that the participant undertakes about the "fit" of a specific search mode to a specific task.

A specific description of how the dependent variables are measured is provided in the Methods section. Broadly speaking, the dependent variables are measured in the following ways:

a. Total amount of search, Time spent on search, *and* Simulated purchase/simulated decision are directly measured,
b. Consideration set is a self-reported item,
c. Satisfaction, Enjoyment, Perceived Effort, *and* Loyalty are measured with an existing scale,
d. Word of mouth is a qualitative account by each participant, where they are required to send a written note (in the form of an e-mail) about their search experiences to a friend after the completion of each search task.

Independent Variables

Two manipulated factors are explored in the two studies: (1) Mode of Search and (2) Task Type. In brief, the Internet enables new search modes (e.g., the Internet from a fixed location, and with wireless technology). The two experiments are, therefore, designed to explore and obtain a better understanding of the effects of different *search modes* on information search behavior. The other factor studied, *task type*, is important as this allows us to explore different

types of search tasks that consumers typically undertake. A search task is defined as a judgment task, where participants are required to make a choice based on their subjective responses. A study of the search processes involving different search tasks in these search modes will provide us with an opportunity to compare and contrast search behaviors in the different modes.

Control Variable

Format of information presentation affects information processing (Bettamn and Kakkar 1977). Therefore, the format in which information is presented to participants is kept the same for *all search tasks* for all *search modes* in both the experiments. This ensures that there is no confounding effect arising from the format in which information is presented for the different search tasks. Information is presented to the participants in terms of brands and attributes.

Covariates

Several individual difference variables have been seen to affect consumer information search behavior. Some of these are included as covariates in the study. All the covariates are individual difference variables each of which have a high bearing on the search tasks that participants undertake.

Tolerance for ambiguity (Budner 1962) is defined as the tendency to perceive ambiguous situations as desirable (and intolerance for ambiguity as the tendency to perceive ambiguous situations as undesirable). Budner suggests that an ambiguous situation is defined as *any one* of the following: a) a completely new situation with no familiar cues; b) a complex situation where a great number of cues have to be taken into account; and c) a contradictory situation where incongruous information exists. The search tasks in our experiments require that participants face situations similar to a) and b) justifying the inclusion of this individual difference variable as a

covariate. It has generally been seen that individuals more tolerant of ambiguity search for more information (Bettman 1971).

Need-for-cognitive clarity (Cox 1967) is defined as the need for cognitive certainty. Individuals high in need for cognitive clarity are more likely to incorporate new information and change their product evaluation. Tolerance for ambiguity and need for cognitive clarity are measured using extant scales.

Prior experience (Jacoby, et al. 1978; Moore and Lehmann 1980) also affect information search. Therefore, it is made sure that the participants who are included in the study have a minimum amount of exposure to the Internet. Only those participants are included in the study who have been using the Internet regularly for at least one year *and* who have conducted at least one monetary transaction on the Web.

Demographic variables, i.e., income, age (e.g., Engel et al., 1978; Claxton et al. 1974; Newman and Staelin 1972; Philips and Strenthal 1977) have been seen to affect information search and processing. **Income** is treated as a covariate in the experiments. Middle income seem to prompt greater information search as compared to very high or low incomes (e.g., Engel et al. 1973; Claxton et al. 1974).

Information Seeking Self Efficacy represents an individual's perception of his/her ability to use a mode of search to find information. This scale is an adaptation of the Web Health Information Seeking scale (Provost 2004), which has been developed to measure an individual's perception of his/her ability to search the Internet to find health-related information.

Price Sensitivity represents the reaction of individual consumers to different levels of *price* for the same product or to changes in *price*. *Price* sensitive consumers are less willing to pay higher *prices* than their less sensitive counterparts who apparently value the product enough

to pay more for it. Since heavy users of a product seem to want and need it more than light and non-users, they should be expected to express a willingness to pay more, that is, to be less *price* sensitive. *Price sensitivity* was measured by the six-item self-report scale shown in Goldsmith (1996).

OBJECTIVES

The specific objectives associated with the experiments are:

a) To propose a framework for modes of search.

b) To understand process differences in the 3 different search modes (i.e., in-store, e-commerce, m-commerce)[16].

c) To explore the roles of both memory-based *and* stimulus-based searches in the different modes of search.

d) To test three theories (cost-benefit theory, categorization theory and media richness theory and task-media fit) in the context of search behavior.

CONCEPTUAL DEVELOPMENT

In this section we lay the conceptual bases for the hypotheses tested in this study. Discussions on the *modes of search*, *task type, task-media fit* and the *theories* tested (e.g., media richness theory, task-technology fit, cost-benefit theory and categorization theory) are undertaken here. We begin with a discussion of the theories (providing the conceptual bases for the hypotheses), followed by the discussions of the manipulated factors in the experiments, followed by a description of the different search tasks that the participants undertake.

[16] A detailed discussion of and an explanation for choosing these three modes are provided in the subsequent sections.

Modes of Search

Consumers collect information through various modes of search. For instance, advances in technology (especially with respect to networks) have made it possible for consumers to search for information over the Internet. "Mode of search" is defined as the medium in which consumers undertake information search (e.g., store, Internet). In this study we explore the phenomena of searching for information in different modes, by assigning participants to specific search modes, where they are asked to carry out different search tasks.

The majority of past research regarding pre-purchase search has usually concentrated on exploring consumer search only on one mode (i.e., in one medium) at a time in a single study. This, we argue, while explores the mechanisms of consumer search in a particular mode of search, does not explore responses of similar consumers to the same search task in other modes of search. Especially with the Internet playing an important role in the search process, and the advent of a plethora of technical devices, it would be illuminating to study the search processes in the different modes.

We argue that a search mode affects the way in which consumers search for information. As is suggested by media richness theory, the medium in which a task is carried out might influence the outcomes of the task. It is similarly possible that the amount of search undertaken, the sequence of search and the way information is accessed and processed might be different depending on the mode of search in which the search task is carried out. These differences might be due to a set of "associated characteristics" that each search mode uniquely possesses. For example, a person might perceive the interactivity afforded by the capabilities of the Internet as being desirable for a particular search task, while it might be perceived as being redundant for a different search task. These "associated characteristics" are defined in terms of the "costs" and

the "risks" associated with each search mode, as this allows us to frame competing hypotheses through cost theory and categorization theory. These costs and risks are assumed to be a function of the search mode. A discussion of the costs and risks related to the specific modes and the associated hypotheses are presented later.

Framework for Modes of Search

The media literature has a long tradition of studying different communication technologies, based on their capacities for transmitting various types of information, (e.g., Donabedian et al. 1998; Fowler and Wackerbarth 1980). Many of these studies are conceptually based on media richness theory (Daft et al. 1987). Some of the findings from testing the media richness theory indicate that the task characteristics (i.e., *generation of ideas*, *intellective*, *judgment* and *negotiation* tasks), along with characteristics of the media (i.e., *face-to-face*, *video*, *audio* and *computer-based* communications) in which communicators are engaged, have an effect on the nature and quality of the communication (e.g., Jones et al. 1988-1989; Galegher et al. 1992). The task-media fit theory and the media richness theory lend support to these findings. As already mentioned, we suggest a framework for modes of search. We turn specifically to media richness theory to better define the characteristics of "modes of search" that we explore in our experiments.

An inherent assumption in Media Richness Theory (MRT) (Daft and Lengel 1984, 1986; Daft et al. 1987) is that a "rich" medium will be more successful than a "lean" medium in communicating content. All communication channels (e.g., text, audio, video, face-to-face) have capabilities that lead to "distinct, objective richness" (Carlson and Zmud 1999; p. 154). Media richness, hence, refers to a channel's abilities to communicate information. Given that there are differences among channels with reference to their abilities to communicate information,

channels can then be arrayed along a continuum describing their relative richness which is referred to as the "media richness continuum" (Rice 1992; Sitkin et al. 1992; Trevino et al. 1990), where there is an "increasing potential richness of information" associated with each medium as one moves along this continuum (Tables 2 and 3).

We base our framework on two dimensions:

1) "Increasing Potential Richness of Information" (McGrath and Hollongshead, 1993) and,

2) The *Interactivity* (*interactive* or *not interactive*) afforded by the mode (e.g., Alba et al., 1997, suggest that the interactivity of a medium contributes richly to the search experience of consumers). *Interactivity* is defined as the capability of a mode of search to provide information on a specific query. In other words, it affords two-way communication. Moreover, a mode of search that allows incorporates interactivity is assumed to be more "rich" than a mode of search that does not. The different types of modes of search are identified in Table 2 (Chapter 1).

Finally, all the identified modes of search can be aligned along the continuum "increasing potential richness of information for decision making" (see Table 3). Therefore, catalog search is the least "rich" mode of search according to our framework, while store search is the most "rich". Radio, television, interpersonal search, telephone and the Internet (M-Commerce and E-Commerce) are modes of search that appear along this continuum, with the media richness increasing in that order. Development in network capabilities, have made it possible for the Internet to be accessed even from hand-held devices (mobile technology), leading to increased

opportunities for m-commerce. In our framework, we conceptualize m-commerce as being less "rich" than e-commerce based on media and interface capabilities.

As can be seen from Tables 2 and 3, even though we identify a variety of modes in which search is undertaken by the consumer, we do not study all the modes of search in our experiments. This is because, in the experiments, we concentrate only on "goal-directed search". We define "goal-directed search" as an information search exercise in which the consumer is looking for specific information from the sources consulted. Therefore, the modes of search that we choose to explore in the two experiments (e.g., in-store, e-commerce and m-commerce) are determined from the framework in the following manner (the same format of data presentation is used for all search tasks in the same mode):

- Channels in which consumers actively seek information
- Information is sought in these channels, in person
- Information is gathered for a specific purpose (where information search is not incidental – i.e., where one does not come upon the information incidentally)

Therefore, some modes of search (e.g., radio, TV) are not appropriate for investigation here, as most of the information obtained from these modes are incidental. The other mode of search (e.g., interpersonal search) is not empirically investigated due to the limited nature of means available. Hence, we empirically study the following modes:

a) M-Commerce (text/interactive)

b) E-Commerce (text/interactive)

c) In-store (face-to-face/interactive)

The three modes of search explored in the experiments can thus be arrayed along "increasing potential richness of information for decision making". The degree of richness of the

modes of search increases (lean to rich) as one moves from the left to the right (Table 31). Table 31 is a sub-set of Table 3, thus:

Table 31: Increasing Potential Richness of Information for Decision Making

Increasing Potential Richness of Information for Decision-Making →		
Text/Interactive	Text/ Interactive	Face-to-face/ Interactive
M-Commerce (Wireless PDA)	E-Commerce	In-Store

Task Type

Information search, as an activity, can be conceptualized as a task that consumers undertake before making a decision or choice. In order for a better understanding and for providing a working definition of this conceptualization, we turn our attention to exploring literatures which have a long history of taking a "task" view.

Research in organizational studies and information systems show "task type" as being important (see Zigurs and Buckland 1998). Most studies underscore the importance of taking the characteristics of the type of task into consideration, as this has an impact on the nature and the outcome of the task at hand. Task has been defined in various ways, with varying conceptualizations. Four broad conceptualizations are encountered in extant literature: a) task as behavior description, b) task as ability requirement, c) "task qua task", and d) task as behavior requirements (Hackman 1969).

For the purposes of providing a working definition of information search as a task, we suggest integrating the third and the fourth views mentioned above because the tasks that the participants are given require the completion of those tasks as a behavior outcome. Campbell (1988) suggests this kind of an integration when defining task type for dyads. Therefore, information search activity can also be seen as an integration of the actual task materials that are presented to the person ("task qua task" Hackman 1969) and the behavior that is required to complete the task.

McGrath and Hollingshead (1994), propose four general task categories for goal-directed behavior: a) generation of ideas, b) choosing a correct answer, c) choosing a preferred answer and d) resolving conflicts of interest. Among these task types,

- Generation of ideas do not fall in the purview of information search tasks.
- Choosing a correct answer is an intellective task, i.e., it is a task that has factual answers that can be established on reasoning and factual information. This is not how a typical information search that a consumer undertakes, can be described.
- Preference tasks do not have factual answers (Kedia and Bhagat 1988) – these are judgment tasks, which is typical of information search tasks that consumers typically undertake.
- Resolving conflicts of interest do not describe information search tasks.

When consumers search for information, they are usually looking to make a preference judgment. Therefore, this is the type of task that will be given to the participants in this study. The other three types of tasks (generation of ideas, intellective task and resolving conflicts of interest) will not be discussed further.

Consumers' involvement in a decision-making task varies (e.g., Biehal and Chakravarti 1986; Childers and Houston 1984). Task characteristics have an impact on the way in which people search (e.g., Jacoby et al. 1974; Wright 1974). Key task variables include types and numbers of alternatives and attributes (e.g., Scammon 1977; Ratneswar et al. 1987), time pressure (e.g., Beaty and Smith 1987), formats (e.g., Bettamn 1975; Bettman and Kakkar 1977) and task complexity (e.g., Henry 1980; Formisano et al. 1982).

There is no single way in which a *simple* vs. *complex* task is identified. Task complexity is a composite of different task characteristics. In our experiment we define **task complexity** characteristics in terms of *number of alternatives* (where an increasing *number of alternatives* increases the complexity of the task). *Number of alternatives* is defined as a choice situation having *few alternatives* vs. *many alternatives*, depending on the number of information cues that must be processed for completing the task. A simple task is defined as one where lesser number of information cues need to be processed for decision making than in a complex task (e.g., Shaw 1973; Wood 1986). The *format* of the task given to participants is treated as the control variable in the two experiments. Specifically, we study the effect of task type (*simple/complex task* – tasks that lay along a complexity continuum*)* on information search.

For each search task, participants will have to process information cues in order to make a decision. The number of cues presented to participants will increase progressively from a simple task to a complex task, also leading to an increase in the associated search costs. The level of difficulty associated with each task will compound these costs of search. Therefore, the search tasks that subjects will be expected to undertake, can be represented on the continuum of simple-complex, thus (Table 32):

Table 32: Simple →Complex

Few Alternatives (Simple**)**	More Alternatives (**Not-So-Simple**)	Many Alternatives (**Complex**)

Dimensions of Task Type (Simple → Complex Tasks)

Newell and Simon (1972) propose that the task environment "determines to a large extent the behavior of the problem solver, independently of the detailed internal structure of his information processing system" (p. 788). An important part of the decision task environment is the perceived level of difficulty. Task complexity dimensions have been variously proposed as taking into account the number of attributes and their complexities (Olshavsky 1979), the language used, the level of abstractedness and the redundancy involved that might affect the way in which information is processed (Howard 1977), and the complexity of the goods or services involved (Olshavsky and Smith 1980).

All these views of task complexity fit well with the information load perspective that suggests that the amount of information that a decision maker must consider has a bearing on the outcome of the decision task (Jacoby, Speller, and Kohn 1974). These are the reasons why we choose to define *task type* in terms of "simple/complex", instead of in terms of any other classification scheme (see Table 33). Other classification schemes of how task has been conceptualized in literature, is presented in table 33.

Table 33: Examples of Task Classifications (Zigurs and Buckland, 1998)

Author(s)	Classification Schemes (Tasks)
Carter, Hayhorn, and Howell (1950)	Clerical, discussion, intellectual construction, mechanical assembly, motor coordination, reasoning
Shaw (1954)	Simple vs. complex
Bass, Pryer, Gaier, and Flint (1958)	Easy vs. difficult
Hackman (1968)	Production, discussion, problem solving
O'Neill and Alexander (1971)	Discussion, decision, performance
Steiner (1972)	Unitary vs. divisible, maximizing vs. optimizing, prescribed process vs. permitted process (disjunctive, conjunctive, additive, discretionary)
Shaw (1973)	Difficulty, solution multiplicity, intrinsic interest, cooperation requirements, population familiarity, intellectual-manipulative requirements
Poole (1978), McGrath (1984), DeSanctis and Gallupe (1987)	Generate (planning vs. creativity), choose (intellective vs. decision making), negotiate (cognitive conflict vs. mixed motive), execute (contests/battles vs. performance/psychomotor)
Wood (1986)	Task complexity is comprised of the building blocks: products, (required) acts, and information cues
Campbell (1988)	Simple, decision, judgment, problem, fuzzy
Junglas (2003)	Ubiquity and Uniqueness (time, location, identity)

Task-Media Fit

We now introduce the idea of task-media fit. The concept of "fit" has been widely used in other disciplines. For example, in the media literature, task-media-fit theory (TMF – McGrath and Hollingshead 1994) suggests that certain kinds of tasks are best suited for a specific communication medium. TMF is based on and is an extension of the media richness theory. MIS literature offers the idea of task-technology fit (TTF). Similarly, strategy literature defines the concept of "fit" variously. For example, Venkataraman (1989) distinguishes among six different perspectives of the construct "fit": a) matching; b) covariation; c) gestalts; d) moderation; e) mediation; and f) profile deviation. The construct has also been suggested in other theories, like the Theory of Cognitive Fit (Vessey 1991).

As can be seen, "fit" has been defined in terms of the context in which it is explored. We define "fit" in the lines of that suggested by the first category of perspectives presented above. "Fit" is the "match" that consumers perceive between a *specific task type* and *particular search mode*. In keeping with the rationale given above, we suggest that "fit" occurs when a particular mode of search supports the optimal accomplishing of a certain search task.

We argue that *modes of search* (media) might have an impact on the *performance* of a search task. We suggest that there are search tasks that can be accomplished better through a particular medium than through another. We turn to task-media-fit (TMF – McGrath and Hollingshead, 1993) as developed in the media literature (as already described). If the media has the exact requirements needed to complete the task, then it is more likely to result in a higher performance. We extend TMF to the information search domain and similarly argue that if a particular mode of search supports the accomplishing of a certain search task, it will also result in a better performance of the search task.

For example, the availability of mobile-technology-enabled search devices does not completely do away with the need for conducting information search in an in-store environment. Technology plays an important role in some modes of search (m-commerce and e-commerce), while there are other modes where its role is limited (e.g., catalog, telephone). However, no attempt has yet been made to study if there is any impact of the mode of search on the performance of different types of search tasks undertaken. The idea of "fit" is incorporated in order to explore this facet of consumer search behavior.

HYPOTHESES

This section introduces all the hypotheses for the first two experiments. The hypotheses for *search mode* are discussed first. These are followed by the hypotheses for *task type*. For both *search mode* and *task type* a description of each search mode or type of task is given along with the associated hypotheses. These are followed by the hypotheses for *task-mode fit*, hypotheses for the covariates and the interaction hypotheses.

Theoretical Basis for the Hypotheses

Cost-benefit framework, Categorization theory (through the mechanisms of situational risk) and Media Richness Theory (and hence Task-Media Fit) are used to make predictions about information search in the different modes and of different task types. These theoretical frameworks are chosen because first, the meta-analysis shows that the most-used paradigm that has been employed to study/represent the information search context, is the cost-benefit framework e.g., Beatty and Smith 1987; Srinivasan and Ratchford 1993) (Please Chapter 2). Second, categorization theory, as a conceptual basis, allows us to frame competing hypotheses through the mechanism of perceived risk associated with each mode of search. Third, Task-

media fit (based on media richness theory) has not been applied to a search context to investigate whether a "fit" exists between a task type and a mode (*media*) of search.

Cost-benefit Theory

In the extant information search literature, it is widely acknowledged that there is a cost to acquiring and processing information (e.g., Punj and Staelin 1983; Srinivasan and Ratchford 1991; Bakos 1997). As a consequence of these costs, Stigler (1961) argues that the consumer will continue to search for additional information only until the utility obtained from additional information is smaller than the cost involved in obtaining it. This describes the cost-benefit framework, where normative models of information search derived from economic theory propose that the consumer screens alternatives to form consideration sets and that *diminishing returns* set in after marginal costs outweigh marginal benefits of search (Srinivasan and Ratchford 1991). The amount of search undertaken *increases* as long as perceived cost is lower than the utility obtained till a point where perceived cost equals utility obtained. As perceived cost increases beyond this equilibrium, there is a *decrease* in the amount of information search undertaken. Therefore, the amount of information searched **follows an inverted-U shaped curve**.

Most of the formulated hypotheses (on mode of search and task type) are based on cost-benefit theory. The "costs" we consider in the different modes and task types are defined in terms of cognitive search costs (as opposed to physical search costs).

Categorization Theory

Categorization theory suggests that the overall perception that a consumer has for a product category is transferred on to a specific product in that category (Mervis and Rosch 1981). In the context of retail literature and hence, mode of search, categorization theory predicts

that the general attitude an individual holds towards a particular mode of search is likely to affect the consumers' perceptions and attitudes towards specific stores in that mode of search (Bauer and Greyser 1968; Darley and Lim 1993; MacKenzie and Lutz 1989). For instance, a person's attitude towards transacting over the Internet will affect the person's attitude towards transactions on a specific Website. Therefore, according to categorization theory, we can expect that if consumers have specific notions about the risks associated with a mode of search based on their evaluation of the *overall* mode, then they will hold similar notions about particular stores in that search mode.

Marketing literature suggests that risk levels and information search are positively correlated (Murray 1991; Newman 1977). In fact, risk encountered in an information search situation can be reduced by additional information acquisition and processing (Crocker 1986; Lutz and Reilly 1973; Davis et al. 1979; Mitra et al, 1999). Consumers, especially those who perceive a high risk involved in an information search situation, may proactively search for more information, thereby trying to reduce the risks associated with that particular transaction. Therefore, as perceived risk *increases*, there is an *increase* in the amount of information search undertaken. In other words, information search **follows an upwardly rising curve**.

Media Richness Theory

Media Richness Theory (MRT) (Daft and Lengel 1984, 1986; Daft et al. 1987) suggests that rich media allow communication of complex and difficult issues while the communication of routine activities are best carried out in lean media. Communication media differ in the richness of information processed. Communication channels are conceptualized as possessing a set of objective characteristics that determine each channel's capacity to carry "rich" information. This is based on feed-back capability, the communications channel utilized,

language variety and personal focus. The more a medium incorporates these elements, the richer it is. McGrath and Hollongshead (1993) classify media for communication along a continuum of "increasing potential richness of information". The four types of media that are identified by them are: *text* (computer systems), *audio systems*, *video systems* and *face-to-face* communications. Face-to-face is considered the richest medium as it allows mutual feedback and simultaneously conveys a variety of cues (e.g., tonal, facial, emotional). Text is considered the least rich. Our framework for the modes of search (media in which consumers carry out information search) is conceptually based on the media richness theory.

Competing Hypotheses

Cost and Categorization theories are used to frame competing hypotheses for modes of search and task type, which are presented in Table 34. As is mentioned in the previous section, for the amount of information search undertaken, cost theory predicts an inverted U-shaped curve while categorization theory predicts an upwardly rising curve. These expectations help us make predictions for each mode of search (e.g., in-store, e-commerce and m-commerce) and each task type (simple → complex).

Hypotheses for Modes of Search

Though technology might help reduce search efforts (physically), cognitive cost might not be sufficiently reduced. For example, the Internet provides consumers with information that is easily available – especially in terms of the amount of information made available (moreover, mobile technology allows for information search even when on the move) – but the choice process involves cognitive effort. Hence, cognitive costs are associated with processing information. Moreover, the associated benefits may also vary as this might be dependent on the proficiency of the consumers. This section discusses the hypotheses for each of the modes of

Table 34: Pairs of Competing Hypotheses for Search Modes

Number	Hypotheses	Theory
H1(a)	As the media richness of the mode decreases, the costs of search increase. As a result the total information search undertaken follows an inverted U-shaped curve.	Cost Theory
H1(b)	As the media richness of a mode decreases, the perceived risk associated with the search modes increases, leading to an increase in the total information search undertaken. (+)	Categorization Theory
H2(a)	As the media richness of the mode decreases, the costs of search increase. As a result the time spent on total information search follows an inverted U-shaped curve.	Cost Theory
H2(b)	As the media richness of a mode decreases, the perceived risk associated with the search modes increases, leading to an increase in the time spent on total information search. (+)	Categorization Theory
H3(a)	As the media richness of the mode decreases, the costs of search increase. As a result, consideration sets and decision making are progressively **less** stimulus-driven and **more** memory-driven.	Cost Theory
H3(b)	Even though the media richness of the mode decreases and the costs of search increase, consideration sets and decision making are **always** memory-driven.	
H3(c)	As media richness decreases and the risks associated increase. As a result, consideration sets and decision making are **more** stimulus-driven and **less** memory-driven.	Categorization Theory

search. A description of each search mode as they are conceptualized in the experiments along with the set of associated hypotheses are given below.

In-Store Search

Conducting information search inside a store involves undertaking search in a medium that is *face-to-face* and *interactive*. This is store search as we traditionally know it. This is also the most "rich" medium of search in the "potential richness of information for decision-making" continuum in our framework. Participants are allowed two-way interaction with the medium. For the purposes of the experiments, in-store search refers to information search undertaken at a single store.

Since this mode is the most "rich" among the modes of search being investigated, it means that a *low* degree of cognitive effort on the part of the participants is required for processing the information, which means that low search costs are involved. The perceived costs associated with information search do not outweigh perceived benefits of the search. Therefore, according to cost-benefit theory, the total amount of information searched for and the total time

spent on search by participants "in-store" will be *less* than that in less "rich" modes of search, where higher cognitive costs are involved in undertaking search. Hence we argue that as the richness of the mode decreases, there is an increase in the costs of search associated with that mode. In the experiments, people's perceived cost of search, is measured after each search task. Hence, if cost theory holds, we expect that higher the perceived cost, lower the amount of search.

Based on cost theory, this results in the total information search following an inverted U-shaped curve (Hypotheses 1(a) and 2(a); Table 34). As shown in Figure 4, m-commerce shopping is the least "rich" medium and in-store shopping is the most "rich" medium.

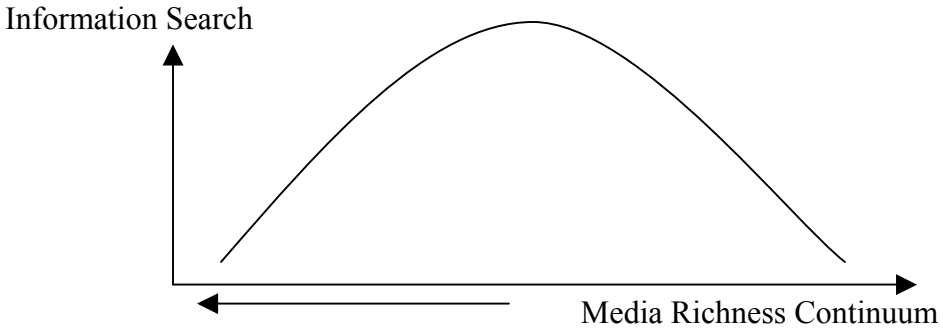


Figure 4: Predictions According to Cost Theory: For Modes of Search

H1(a): As the media richness of the mode decreases, the costs of search increase[17]. As a result the total information search undertaken follows an inverted U-shaped curve. (As shown in Figure 4)

H2(a): As the media richness of the mode decreases, the costs of search increase. As a result the time spent on total information search follows an inverted U-shaped curve. (As shown in Figure 4)

Alternately, as categorization theory suggests, the risks associated with this mode of search will be much *lower* than those associated with the other modes of search, because of the richness of the medium as well as because consumers are traditionally used to this mode. In the experiments, people's risk-averseness, as a personality trait, is measured after each search task. Hence, if categorization theory holds, we expect that risk averse consumers will be less tolerant of the inherent risk associated with the search mode. Therefore, they are more likely to undertake greater information search. This lower perceived risk will lead to a *lower* amount of information searched in the in-store mode, which leads to hypotheses 1(b) and 2(b) (Table 34; Figure 5).

[17] Perceived Cost is measured as a covariate, the findings are discussed in the results of the individual experiments section.

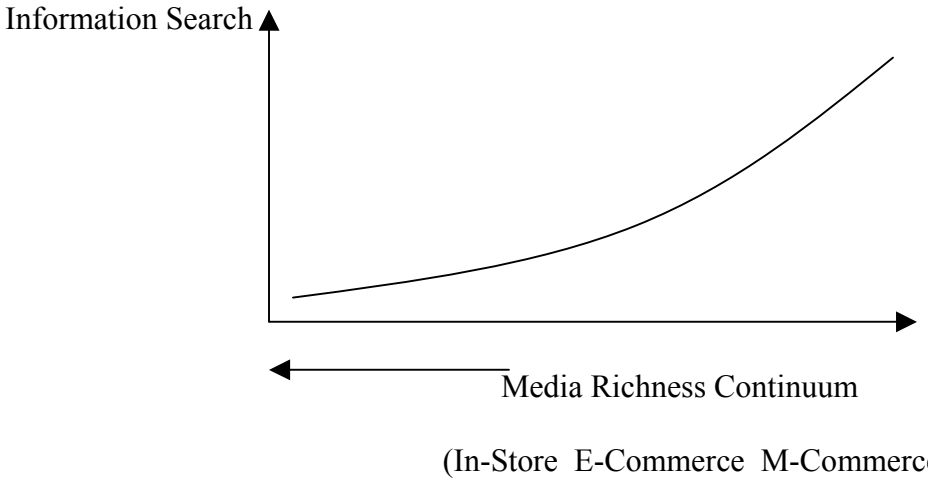


Figure 5: Predictions According to Categorization Theory: For Modes of Search

H1(b): As the media richness of a mode decreases, the perceived risk[18] associated with the search modes increases, leading to an increase in the total information search undertaken. (+) (Figure 5)

H2(b): As the media richness of a mode decreases, the perceived risk associated with the search modes increases, leading to an increase in the time spent on total information search. (+) (Figure 5)

Further, the in-store medium affords immediate feedback. This will lead to an *increased* dependence on stimuli compared to other search modes that are less "rich". Hence, according to cost theory, decision-making will be more stimulus driven than memory-driven. Consumers will rely less on their memory for choosing consideration sets and for making decision. Similarly, most of the consideration sets and decision-making will be attribute-based (and less brand-based). This will specifically be tested by making the information needed to complete a search task available in two blocks (see Figure 5). This leads us to hypothesis 3(a) (Table 34).

H3(a): As the media richness of the mode decreases, the costs of search increase. As a result, consideration sets and decision making are progressively **less** stimulus-driven and **more** memory-driven. (-)

Alternately, the consensual conclusion that consideration sets are primarily memory-based and memory-driven (e.g., Biehal and Chakravarti 1986; Lehmann and Pan 1994;

[18] Perceived Risk is measured as a covariate, the findings are discussed in the results of the individual experiments section.

Nedugandi 1990; Ratneshar, Pechman and Shocker 1996), might hold. In other words, there might not be any effect of the modes themselves. In that case, consideration sets and decision-making across all modes will be memory-based and there will be no difference among the searches undertaken in the different modes (hypothesis 3(b), Table 34).

H3(b): Even though the media richness of the mode decreases and the costs of search increase, consideration sets and decision making are memory-driven.

Or, if categorization theory holds true, then:

H3(c): As media richness decreases and the risks associated increase. As a result, consideration sets and decision making are **more** stimulus-driven and **less** memory-driven.

The following section explores pre-purchase information search in the context of accessing the Internet from a fixed location (e-commerce) as a search mode. Again, a set of hypotheses is laid which draws upon the objective characteristics of that particular mode of search.

E-Commerce

The Internet provides consumers with an opportunity to have more control over the information search and acquisition processes (Hoffman and Novak 1996). Given the interactive character of the Internet, which makes it distinct from other modes of search, the processes and sequences of online searches might be different from that exhibited in the other modes. Information obtained on the Internet (fixed or mobile) is usually from a Website. The *interactive* component of Internet searches gives the consumer some sort of control over the search process.

E-commerce is a search mode where information is accessed by participants from a computer terminal. We categorize this mode of search as being *text* and *interactive*. This is a *more* "rich" mode of search than **m-commerce** (explored in the next section), *but* a *less* "rich" mode of search than **in-store** (as discussed above). This is because consumers can access

specific information in the text format on e-commerce as well as m-commerce, but e-commerce is a more "rich" mode than m-commerce, because of the difference in the interface. A larger screen is available for accessing information on e-commerce, as compared to a small screen on a hand-held PDA. Accessing the Internet from a fixed location is similar to our experiences of browsing the Internet from a desktop or a laptop (not wireless) and unlike in the next search mode, participants are not restricted to processing information from a small screen.

Extant literature suggests that because of an increase in the amount of information available, the cost of undertaking search on the Internet is lower than it is through less "rich" modes (e.g., Oorni 2003). For example Bakos (1997) posits that declining physical search costs enable consumers to undertake greater amounts of pre-purchase search. Especially with respect to the interactive home shopping, Alba et al. (1997) suggest that this kind of a shopping environment provides consumers with a lot more control over the search process, which is essentially a great improvement over traditional retail formats.

The foregoing means that the richness of the medium (with the fixed location afforded by this search mode, along with a larger screen to process information from) results in:

a) *lower* demands on cognitive abilities are made by the search tasks compared to when the same search tasks are carried out on a mobile device. Therefore, a *lower* degree of cognitive effort is required on part of the participants to process information when undertaking search tasks from a fixed computer terminal as compared to when undertaking them from a mobile device.

b) But*, higher* demands on cognitive abilities are made by the search tasks compared to when the same search tasks are carried out at a physical store. Therefore, a *higher* degree of cognitive effort is required for the search tasks

when they are undertaken from a computer terminal as opposed to when they are undertaken in-store.

Therefore, according to cost-benefit theory, the amount of information searched and the time spent in this mode will be *more* than in-store (Hypothesis 1(a) and 2(a); Table 34) as the associated benefits of search still outweigh the costs of search. The amount of information searched *peaks* (i.e., is the highest) in this mode, with benefits of search outweighing costs in this mode.

Alternately, it has been argued that because the Web is a new commercial medium, consumers often perceive risks associated with its use, which are usually higher than those associated with in-store searches (Kiel and Hodkinson 2003). One of the commonly-cited reasons for the higher perceived risk has been the "newness" of the medium. Therefore, according to categorization theory, the overall risk associated with this mode is higher than that associated with in-store search, which leads to a higher information search and a higher time spent on search. Hence, hypotheses 1(b) and 2(b) (Table 34).

The Internet invests in the consumer a sense of control over the search process. If cost theory holds, then consumers' cognitive effort is reduced because of the ability of the Internet (and hence technology) to substitute for their own memories. Therefore, in the context of cost theory, we hypothesize that consumers using e-commerce will construct consideration sets and make decisions that are **less** stimulus-driven and **more** memory-driven than less "rich" modes of search. The bigger screen provided for processing information leads to an *increase* (e.g., motor movements) in the involved search costs as compared to in-store searches but a *decrease* in the involved search costs as compared to m-commerce. This will lead to a *decreased* dependence on

stimuli in this search mode as compared to the latter modes (and, an *increased* dependence on memory as compared to in-store search). This leads us to hypothesis 3(a) (Table 34).

Alternately, one might argue, as in the previous section, that consideration sets and decision making are primarily memory-based and memory-driven (e.g., Biehal and Chakravarti 1986). Specific features of the mode of search will not have any effect on the way in which information search is undertaken. Hence, hypothesis 3(b) (Table 34). Or, if categorization theory holds, then as the e-commerce medium is less "rich" than the in-store environment, perceived risk will be greater in this mode as compared to the in-store environment. This will prompt a consumer to make decisions, based more on what is available in the immediate environment (i.e., *stimulus*), than rely on *memory*. As a result, hypothesis 3(c) might bear out. In the next section, we look at information search on the Internet on a mobile device.

M-Commerce

Even before electronic commerce has reached its full potential, mobile commerce (m-commerce) has already made forays into areas where its presence, especially with respect to transactions and communications, are already being felt (Clarke 2001). It provides consumers with the ability of carrying out transaction through a wireless Internet-enabled device. Mobile devices have been the fastest adopted consumer products of all times, with last year more mobile phones shipped than automobiles and PCs combined (de Haan 2000). It has been speculated that there will be 1.4 billion mobile phones worldwide by 2003, half of which will be Internet-enabled (Zabala 2000). Therefore, information search that occurs through a mobile device, would be of interest to both consumer researchers and managers. In addition to all the features that are available in the e-commerce universe (i.e., *reachability* (e.g., Lehman Brothers 2000), *accessibility* (e.g., Dulacher 1999), *localization* (e.g., Buckler and Buxel 2000), and

identification (Junglas 2003)) – there is a new dimension that is present in the m-commerce universe – *portability* (Junglas 2003). Hence, portability is one of the distinguishing aspects of mobile devices.

Two major differences between e-commerce and m-commerce are the interface (small versus large screen) *and* the portability of the mobile device. In our study, we recognize these differences as being the most distinguishing between e-commerce and m-commerce. Further, we categorize m-commerce as also being *text* and *interactive*. M-commerce is less "rich" than e-commerce because accessing information through a small hand-held PDA makes it more difficult to access the same information.

Mobile devices span a broad spectrum of offerings, with wireless laptops forming one end of the continuum, while the other end has products like smart phones and personal digital assistants (PDAs). One of the striving goals of current mobile device manufacturers has been to provide maximum benefits and features within the most compact design possible. For the purposes of our experiments, the mobile device that is used is a PDA, which means that participants undertake search tasks through a small screen while on the move.

The cognitive effort associated with conducting electronic searches can be expected to be further magnified when processing information from a small screen as opposed to processing it from a bigger screen. There is an increase in the involved search costs as motor movements are further strained. Additionally, the effects of the portable nature of a mobile device will compound the cognitive costs of undertaking search tasks. Considering these characteristic features, it can be argued that consumers will experience a *higher* cognitive load when processing information through m-commerce than through e-commerce. The associated benefits of search here, however, is *lesser* than the associated costs of search and hence a *lower* amount

of search will be undertaken. Similarly, a *lesser* amount of time will be spent on searching as compared to the previous mode of search, with costs of search outweighing benefits in the next mode. Therefore, if cost theory holds, then we suggest hypotheses 1(a) and 2(a) (see Table 34). This leads to a lower amount of search through m-commerce than through e-commerce.

Alternately, the perceived risk associated with the Internet increases as the consumer uses a mobile device, making the search task more risky than those carried out in other modes of search (e.g., e-commerce and in-store). This would logically mean that in order to reduce risk consumers will, undertake the *greatest* amount of information search on this mode than on the previous modes. In other words, the amount of information searched and the time taken, will follow an upwardly moving curve. This is in contrast to the predictions made by cost theory. Therefore, if categorization theory holds true, we make the predictions in hypotheses 1(b) and 2(b) (Table 34).

According to cost theory, we further hypothesize that consumers accessing the Internet through a mobile device, will display *greater* memory-based and brand-based choice of consideration sets and decision making. Accessing information from a smaller screen increases the costs of search and in keeping with our earlier argument, we suggest that the smaller screen favors an increased dependence on memory-based consideration sets and choices. This leads us to hypothesis 3(a) (Table 35). Alternately, there might not be any effect of the characteristic features of the modes themselves (e.g., Biehal and Chakravarti 1986). Therefore, competing hypotheses are made in hypothesis 3(b) (Table 34). A third possibility is that due to the greater effort that is required to access information, perceived risk increases: this argument can be made based on categorization theory. In this case, consideration sets and choices will be stimulus-based, and hypothesis 3(c) (Table 34) will hold.

Hypotheses for Task Type

In this section the hypotheses related to task type are put forth. Again, cost theory and categorization theory are used as the bases for framing competing theories (Table 35).

Cost of Search and Task Type

A competing set of hypotheses can be suggested, based on economic theories of search, i.e., cost-benefit theory and categorization theory. Simple tasks require processing fewer cues, i.e., pieces of data, than complex tasks (Payne 1982), while complex tasks require the processing of a higher number of cues as compared to simple tasks (Wood 1986). Given this increased processing that is required for successfully completing the task, complex tasks typically tend to involve high cognitive loads that require significant mental effort and attention (Baecker, et al. 1995). Therefore, all cues might not be processed and consumers might resort to applying heuristics and satisficing, instead of optimizing.

Information search literature also suggests that as task difficulty increases, consumers attempt to reduce the cognitive effort required by complex tasks (Bruner 1957; Bruner, et al. 1956; Hogarth 1987; Lussier and Olshavsky 1979; Olshavsky 1979; Payne 1976). Moreover, Simon (1955) refers to this as the "cost of thinking", which might depend on the number of alternatives, similarity and complexity of product alternatives available. For example, Staelin and Payne (1979) contend that high numbers of alternatives and high levels of product complexity will, in fact, lead to limited search activity because the "cost of thinking" increases. Therefore, *amount of information search* and *time spent on search* would probably follow the path of an inverted-U (as suggested by Cost-benefit theory, Figure 6), with the *amount of search undertaken* and *time spent on search* rising for some time (while marginal benefits of search outweigh the marginal costs of search), and then taking a downward swing (when marginal costs

Table 35: Pairs of Competing Hypotheses for Task Type

No.	Hypotheses	Theory
H5(a)	As the perceived cost (reflected by the level of complexity) of a search task increases, the amount of information searched follows an inverted U-shaped curve. (Inverted-U)	**Cost Theory**
H5(b)	As the perceived risk of a search task increases, the amount of information searched increases. (+)	**Categorization Theory**
H6(a)	As the perceived cost (reflected by the level of complexity) of a search task increases, the time spent on undertaking information search follows an inverted U-shaped curve. (Inverted-U).	**Cost Theory**
H6(b)	As the perceived risk of a search task increases, the time spent on undertaking information search increases. (+)	**Categorization Theory**

start outweighing marginal benefits and diminishing returns set in). Srinivasan and Ratchford (1991) has suggested that limiting search may be an optimizing strategy adopted by consumers to cope with the volume and complexity of information available to them (1982). In the two experiments, perceived cost of search is measured each participant. We expect that higher the perceived cost, lower the amount of search. Therefore (see Table 35):

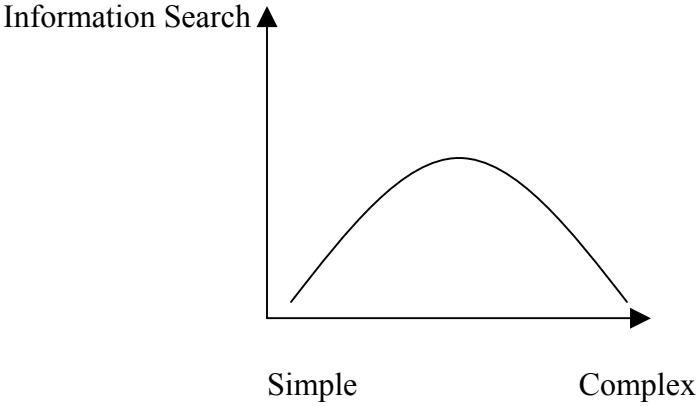


Figure 6: Predictions According to Cost Theory: For Task Type

H5(a): As the perceived cost (reflected by the level of complexity) of a search task increases, the amount of information searched follows an inverted U-shaped curve. (Inverted-U)

H6(a): As the perceived cost (reflected by the level of complexity) of a search task increases, the time spent on undertaking information search follows an inverted U-shaped curve. (Inverted-U).

In our experiments, we have three levels of task difficulty represented. This variation will allow us to capture points along the entire inverted-U shaped curve described above. As is explained in the **Method** section, a pre-test is carried out with five levels of complexity. However, results show that there exists meaningful differences among only three of the levels tested. Therefore, we expect three distinct findings for each of our hypotheses.

Risk (Categorization Theory) and Task Type

In the tasks given[19], the difficulty of the task increases as one moves from one end of the continuum to the other (left to right). Categorization theory suggests that risks reflected in tasks with varying levels of complexity influences information seeking in consumers (Locander and Hermann 1979). When decision task complexity increases, people feel less self-confident about making a good judgment (Brown and Reingen 1987). Hence, the higher the level of complexity of a task, the greater the perceived risk associated with decision-making on the task. Therefore, more information gathering can be used as a risk-reducing strategy. Studies conducted in the off-line environment have found that perceived risk of the purchase is positively related to the total search undertaken (Srinivasan and Ratchford, 1991; Chaudhuri, 2000). In other words, as tasks become increasingly complex along with increasing levels of perceived situational risk, the amount of information search undertaken will also increase. Here, according to categorization theory, the inherent overall perceived risk associated with completing a particular type of task gets transferred to a *specific* task. In other words, the risk (high OR low) associated with a category of tasks is the same as the risk associated with a *specific* task from that category.

Risk might be thought of being the lowest for a simple task and the highest for the most complex task (cite) (Table 32). Consumers will be the most cautious and will search for the highest amount of information while undertaking the most complex task (Figure 7). Task complexity might also influence the consumer's propensity to seek recommendations (Brown and Reingen 1987). In the experiments, the risk-averseness of participants, as a personality trait, is measured after each search task. Therefore, the following hypotheses (see Table 35) can be made on the basis of categorization theory (situational risk) and information theory:

[19] See Table 39 – below

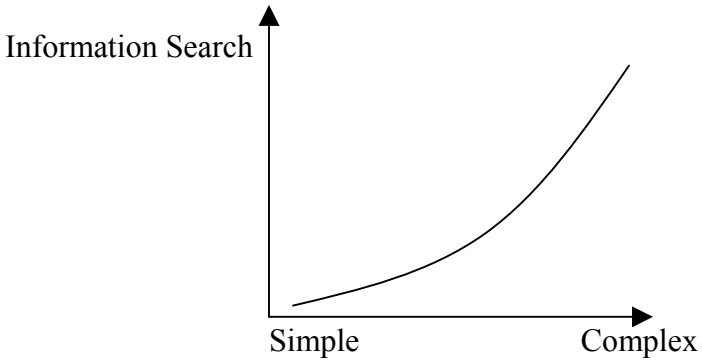


Figure 7: Predictions according to Categorization Theory: For Task Type

H5(b): As the perceived risk of a search task increases, the amount of information searched increases. (+)

H6(b): As the perceived risk of a search task increases, the time spent on undertaking information search increases. (+)

Hypotheses for Task-Media "Fit"

As discussed above, we extend the task-media fit (TMF), developed from media richness theory, to search behavior and suggest that a particular search mode might be better-suited for certain task types over other search modes, and undertaking those types of tasks in the optimal search mode will result in higher perceived fit, satisfaction, loyalty and enjoyment (and lower perceived effort) than when the same type of task is undertaken in another mode of search. We identify three different types of fit, in keeping with TMF:

a) under-fit, a condition where the capabilities of the search mode are perceived as being not sufficiently aligned with the requirements of the task type;

b) ideal-fit, a condition where the capabilities of the search mode are perceived as optimal for the task type; and

c) over-fit, a condition where the capabilities of the search mode are perceived as being more than sufficiently aligned with the requirements of the task type.

Since a particular mode of search is best-suited for a certain kind of search task, if a misfit occurs (i.e., if the medium is not the best one for the given search task – leading to over-fit or under-fit), then it can lead to feelings of lower perceived "fit", as compared to perception of optimal fit.

Turning to the question of measuring "fit", one can categorize the attempts to measure "fit" into objective (e.g., Nance and Straub 1996) and subjective (Davern 1996) measures. Most search tasks that are undertaken by consumers fall in the category of judgment tasks (McGrath and Hollingshead 1994). Therefore, we use subjective measures for measuring the construct of "fit". After completing each search task, participants are asked to provide subjective evaluations on The satisfaction, enjoyment, perceived effort, and loyalty. These will serve as proxy measures of the participants' evaluation of their *performance*s and *perceptions* on these tasks with respect to the particular mode that they are assigned to.

It is hypothesized that a **simple task** is best carried out via **m-commerce**, i.e., "ideal fit" will be perceived when this task is carried out on this search mode. This is because the medium does not afford extensive examination and processing of information as a result of high associated cognitive costs. A **complex task** when carried out **in-store** would result in an "ideal fit" as optimal benefits can be expected in this medium given the associated costs of search (see Hypothesis 4).

H4: Task-media of search fit is perceived by consumers.

Table 36 present sets of hypotheses on "over fit", "ideal fit" and "under fit" (Hypotheses 7(a),(b),(c); 8(a),(b),(c); 9(a),(b),(c); 10(a),(b),(c) – see Table 36). The more "rich" modes of search might pose "distractions" for the simple task. Hence, it is desired that *task* and the *mode*

Table 36: Hypotheses for Task-Mode of Search Fit

	No.	Hypotheses	Theory
Fit	**H4**	Task-media of search fit is perceived by consumers.	**MRT[20] TMF[21]**
Enjoyment	**H7(a)**	An ideal-fit between search task and mode of search will lead to higher individual enjoyment than over-fit	**MRT**
	H7(b)	An ideal-fit between search task and mode of search will lead to higher individual enjoyment than under-fit	**MRT**
	H7(c)	An over-fit between search task and mode of search will lead to higher individual enjoyment than under-fit	**MRT**
Satisfaction	**H8(a)**	An ideal-fit between search task and mode of search will lead to higher individual satisfaction than over-fit	**MRT**
	H8(b)	An ideal-fit between search task and mode of search will lead to higher individual satisfaction than under-fit	**MRT**
	H8(c)	An over-fit between search task and mode of search will lead to higher individual satisfaction than under-fit	**MRT**
Perceived Effort	**H9(a)**	An ideal-fit between search task and mode of search will lead to lower individual perceived effort than over-fit	**MRT**
	H9(b)	An ideal-fit between search task and mode of search will lead to lower individual perceived effort than under-fit	**MRT**
	H9(c)	An over-fit between search task and mode of search will lead to lower individual perceived effort than under-fit	**MRT**
Loyalty	**H10(a)**	An ideal-fit between search task and mode of search will lead to higher loyalty than over-fit	**MRT**
	H10(b)	An ideal-fit between search task and mode of search will lead to higher loyalty than under-fit	**MRT**
	H10(c)	An over-fit between search task and mode of search will lead to higher loyalty than under-fit	**MRT**

[20] Media Richness Theory
[21] Task-Media Fit

represent an ideal fit. Arguing in line with the TMF literature (McGrath and Hollingshead 1993), under-fit occurs when the mode of search does not provide rich-enough information for the search task at hand, while over-fit occurs when the mode of search presents too rich an information environment. Media richness theory predicts that, when an ideal fit is **not** achieved, a richer medium is better suited for decision-making than a less rich medium. Hence,

H7(a): An ideal-fit between search task and mode of search will lead to higher individual enjoyment than over-fit

H7(b): An ideal-fit between search task and mode of search will lead to higher individual enjoyment than under-fit

H7(c): An over-fit between search task and mode of search will lead to higher individual enjoyment than under-fit

H8(a): An ideal-fit between search task and mode of search will lead to higher individual satisfaction than over-fit

H8(b): An ideal-fit between search task and mode of search will lead to higher individual satisfaction than under-fit

H8(c): An over-fit between search task and mode of search will lead to higher individual satisfaction than under-fit

H9(a): An ideal-fit between search task and mode of search will lead to lower individual perceived effort than over-fit

H9(b): An ideal-fit between search task and mode of search will lead to lower individual perceived effort than under-fit

H9(c): An over-fit between search task and mode of search will lead to lower individual perceived effort than under-fit

H10(a): An ideal-fit between search task and mode of search will lead to higher loyalty than over-fit

H10(b): An ideal-fit between search task and mode of search will lead to higher loyalty than under-fit

H10(c): An over-fit between search task and mode of search will lead to higher loyalty than under-fit

Therefore, the hypotheses are formulated such that feelings of lower satisfaction enjoyment, loyalty and higher perceived effort will be the outcomes in both cases of over and under-fit, while ideal-fit will result in feelings of higher satisfaction, enjoyment, loyalty and lower perceived effort. As can be seen from Table 37(a) and 37(b), the highlighted cells represent the ideal task-media fit situations. The cells above those representing "ideal-fit", represent under-fit, while the cells below represent over-fit. If this holds true, then it might mean that there are media that are specifically suited to certain tasks.

Hypotheses for Covariates

The covariates in the experiment are **perceived risk**, **perceived cost**, **prior experience**, **tolerance for ambiguity** (Budner 1962), **demographic variable** (income), **need for cognitive clarity** (Cox 1967), **information seeking self efficacy** (Provost 2004) and **price sensitivity** (Goldsmith 1996). These individual difference variables have already been discussed in the introduction. The hypotheses pertaining to each of these are presented here (see Table 38).

Explanations regarding and the reason for including the covariates are discussed below. Perceived risk and perceived cost are incorporated in the hypotheses regarding *modes of search* and *task type*. Therefore it is imperative that these be examined as covariates.

Perceived Risk

Weber and Bottom (1990) define perceived risk as "choices among alternatives that can be described by probability distributions over possible outcomes" (p. 114). They add an implicit assumption that at least one of the possible outcomes must be undesirable (or at least less desirable than the others) for risk to exist. Studies conducted in the off-line environment, have

Table 37(a): Task-Mode of Search Fit

Task Type **Search Mode**	**Few Alternatives** Airlines ***and*** Restaurant **(Simple)**	**More Alternatives** Airlines ***and*** Restaurant **(Not-So-Simple)**	**Many Alternatives** Airlines ***and*** Restaurant **(Complex)**
M-Commerce (Wireless PDA)	Ideal Fit	Under Fit	Under Fit
E-Commerce	Over Fit	Ideal Fit	Under Fit
In-Store	Over Fit	Over Fit	Ideal Fit

Table 37(b): Task-Mode of Search Fit

Service Type **Search Mode**	**Airlines**	**Restaurant**
M-Commerce (Wireless PDA)	Under Fit	Under Fit
E-Commerce	Ideal Fit	Under Fit
In-Store	Over Fit	Ideal Fit

Table 38: Hypotheses for Covariates and Interaction Between Modes of Search and Task Type

No.	Hypotheses	Theory
H11	The greater the perceived risk an individual has, the more will be the amount of information search undertaken (+)	Categorization Theory
H12	The greater the perceived cost an individual has, the amount of information search undertaken will follow an inverted U-shaped curve	Cost Theory
H13	The greater the prior experience an individual has, the less will be the amount of information search undertaken (-)	
H14	The higher the tolerance of ambiguity in an individual, the more will be the amount of information search undertaken (+)	
H15	Middle levels of income will lead to more amount of information search undertaken	
H16	The higher the need for cognitive clarity, the more will be the amount of information search undertaken (+)	
H17	The higher the information seeking self efficacy, the lower will be the amount of information search undertaken (-)	
H18	The higher the price sensitivity, the greater will be the amount of information search undertaken (+)	
H19(a)	According to cost theory, there is significant interaction effect between the mode of search chosen and the task type for amount of search.	Cost Theory
H19(b)	According to categorization theory, there is an interaction effect between the mode of search chosen and the task type for amount of search.	Categorization Theory

found that perceived risk of the product are positively related to the total search undertaken (Srinivasan and Ratchford 1991; Chaudhuri 2000). The hypotheses presented in Tables 34 and 35 also assume that perceived risk has a positive relationship with the amount of information search undertaken. The following hypothesis follows:

H11: The greater the perceived risk an individual has, the more will be the amount of information search undertaken (+)

Perceived Cost

Perceived costs can be defined as the sum total of all direct and indirect costs the consumer incurs when conducting external information search (Punj and Staelin, 1983). Srinivasan and Ratchford (1991) defined costs of search as the perceived time and monetary costs of undertaking the search effort and the psychological costs of processing the information. Cost theory (Stigler __) proposes that as the cost of search increases, the amount of search undertaken initially rises and then falls. In other words, the initial path (of the relationship between cost of search and the amount of search undertaken) has a positive slope and then has a negative relationship. The hypotheses presented in Tables 34 and 35 also assume that perceived cost has an inverted U relationship with the amount of information search undertaken. Therefore, it is hypothesized that:

H12: The greater the perceived cost an individual has, the amount of information search undertaken will follow an inverted U-shaped curve.

Prior Experience

Prior experience (Jacoby, et al. 1978; Moore and Lehmann 1980) affects information search. Several studies show a negative relationship between the amount of product experience and information search (Newman and Staelin, 1971, 1972). The findings from our meta-analysis

also supports this relationship. Therefore, this variable is included in our experiments as a covariate.

One possible explanation for this finding is the fact that experienced searchers have substantial prior knowledge, so they do not require a lot of information from external sources (Brucks, 1985). Another possible explanation offered is that because of the prior knowledge, consumers are aware of the attributes that are more useful in "discriminating" between the different brands in the product category, and therefore only those are considered while conducting search (Brucks, 1985).

H13: The greater the prior experience an individual has, the less will be the amount of information search undertaken (-)

Tolerance of Ambiguity

Budner 1962 defines tolerance for ambiguity as the tendency to perceive ambiguous situations as desirable (and intolerance for ambiguity as the tendency to perceive ambiguous situations as undesirable). Budner suggests that an ambiguous situation is defined as *any one* of the following: a) a completely new situation with no familiar cues; b) a complex situation where a great number of cues are taken into account; and c) a contradictory situation where incongruous information exists. The search tasks in our experiment require that participants face situations similar to a) and b) justifying the inclusion of this individual difference variable as a covariate.

The concept of tolerance for ambiguity has been linked to information processing. Bettman (1971) in developing a theoretical model for information processing, incorporated tolerance for ambiguity as an influence on both information search and information processing.

H14: The higher the tolerance of ambiguity in an individual, the more will be the amount of information search undertaken (+)

Income

Engel, Kollat and Blackwell (1973) suggest that extended decision making is most likely to be for individuals with higher education, mid-level income and white collar occupations. The findings of our meta-analysis shows that income is a moderator of information search. Hence the following hypothesis:

H15: Middle levels of income will lead to more amount of information search undertaken

Need for Cognitive Clarity

Research on information utilization has examined this personality trait (Cox 1967). This measures the need to "immediately" resolve uncertainty. Individuals high in need for cognitive clarity (certainty) are more likely to incorporate new information and to change their prior product evaluations.

H16: The higher the need for cognitive clarity, the more will be the amount of information search undertaken (+)

Information Seeking Self Efficacy

Internet self-efficacy is "the belief in one's capabilities to organize and execute courses of Internet actions required to produce given attainments" (Bandura, 1986; Eastin & LaRose, 2000). Bandura suggested that self-efficacy should be tailored to the specific domain of interest in order to maximize predictability (Bandura, 1986). Information seeking self efficacy (Provost 2004) is defined as an individual's perception of a consumer's ability to use a specific source to search for information. The higher the self efficacy, the lower will be the amount of information search undertaken. This is measured for each mode of search.

H17: The higher the information seeking self efficacy, the lower will be the amount of information search undertaken (-)

Price Sensitivity

Extant research shows that heavier users of a product are less price sensitive (Goldsmith 2000). Information search literature suggests that heavier users of a product, tend to search for less information. Therefore, it would follow that price sensitivity and information search are positively correlated.

H18: The higher the price sensitivity, the greater will be the amount of information search undertaken (+)

Hypotheses for Interactions

Mode of Search and Task Type

Hypotheses regarding the possible interaction (Figures 8 and 9) effects between the two factors, are explored in this section. When the combined effect of the two factors on the pattern of information search is considered, it might display an interaction effect. According to cost theory, cognitive costs are associated with each of the factors.

a) *Type of task*: Level of complexity of tasks increase with higher number of cues, leading to higher search costs and

b) *Mode of search*: Higher search costs are associated with less rich media

Examined from the perspective of cost theory, the effects of a complex task environment compounded with a "lean" mode of search may increases the costs associated with information search. The foregoing means that the amount of information searched will depend on the combined effect of the characteristics of *mode of search* and *task type*. The combined effect, will mean that low amounts of information search will take place when:

a) Mode of search: In-Store AND Task Type: Simple

b) Mode of search: M-Commerce AND Task Type: Complex

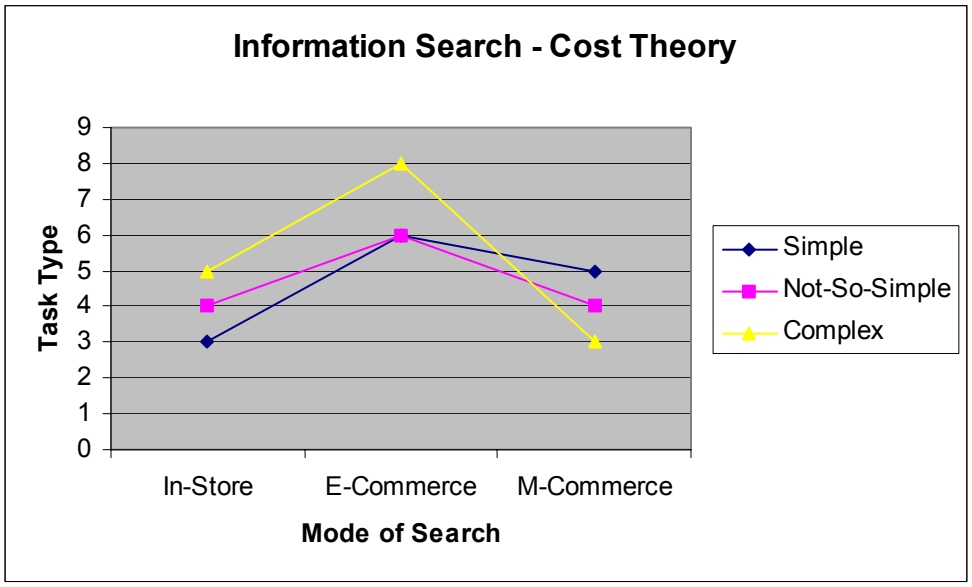


Figure 8: Interaction Effect (Cost Theory)

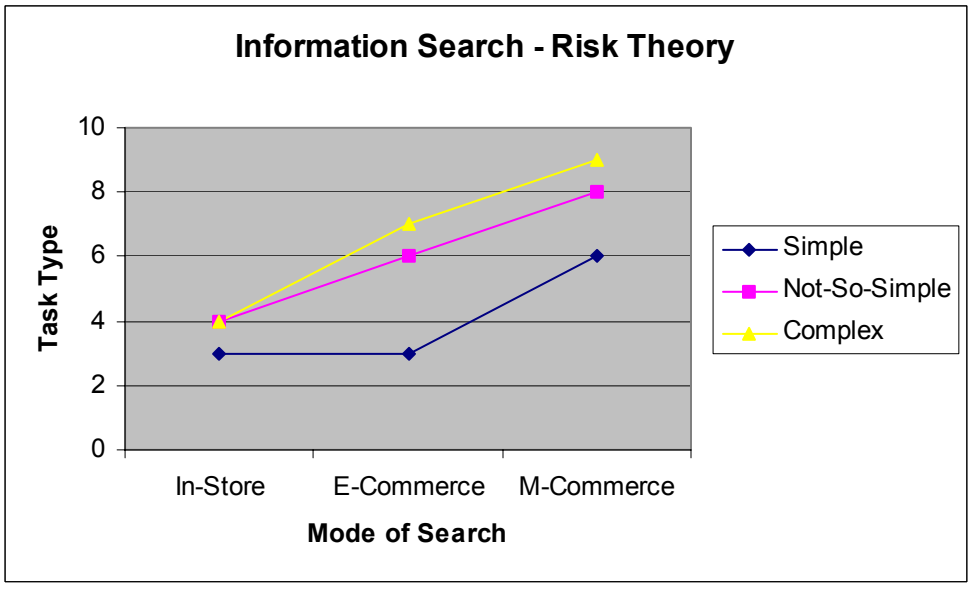


Figure 9: Interaction Effect (Categorization Theory)

For all other combinations information search will be more than at these two points. Hence, examined from a cost-benefit theory perspective, there is a significant interaction effect is predicted (Figure 8).

H19(a): According to cost theory, there is a significant interaction effect between the mode of search chosen and the task type for amount of search.

Examined from the categorization theory perspective, there is a slight interaction effect is predicted (See Table 38). As the level of task complexity decreases, there is a lower propensity to undertake search, whereas, increasing task complexity leads to a greater propensity to search. The effect is highest when the highest risk is perceived because of the compounded effects of level of task complexity and the risks associated with the mode in which the search is undertaken (Figure 9). Thus,

H19(b): According to categorization theory, there is a significant interaction effect between the mode of search chosen and the task type for amount of search.

A DESCRIPTION OF THE PARTICIPANT TASKS

Participants are asked to undertake a search task, at the end of which they are required to make a choice/decision. Before undertaking a discussion of the manipulated factors and the hypotheses, a description of the tasks is provided. There are two different kinds of tasks that have been designed for the experiments (Figures 10 and 11). One requires the participants to search for an airlines tickets, the other requires the participants to search for a restaurant. Three levels of complexity are designed for each of the two tasks.

In Experiment 1, each participant is presented with the description of a task scenario. Then the actual search task is undertaken. Upon completion of a search task, the participant answers a set of questions. Each participant completes one task.

For the purpose of this study, please imagine yourself in the following situation (s):

For the Airlines Ticket Choice Task:

You are a student at the Terry College of Business at the University of Georgia. It is the first week of August – only a few days before the Fall semester starts. You have been in an internship with a reputed company, have worked hard the entire summer and have not been able to get any break for yourself.

While you are at home relaxing, you get a phone call from Mexican Vacations Inc., informing you that you've won the grand prize in its sweepstakes. The agent tells you the prize includes a round-trip flight to Cancun leaving on any Friday of your choice, a limousine to take you to and from the Cancun airport, and seven days and six nights at the five-star Wyatt Royal Resort Hotel on the waterfront .However, the sweepstakes have to be redeemed by the end of this year. You feel that this will work out perfectly, since you'll be finished with the semester by then and you definitely can use a few days of vacation.

Mexican Vacations Inc. is able to offer this promotion to one person only. However, if a friend, is willing to cover airfare expenses, Mexican Vacations Inc. will take care of any other expenses, including hotel charges, restaurant visits, and any amenities that you and your friend would like to use. Since you definitely want to bring your friend, you have to search for a flight to Cancun and make a reservation as soon as possible.

The dates you have chosen are:
Departing: Friday, August 5
Returning: Friday, August 12

To search for and choose a round-trip airlines flight, you need to login.

Figure 10: Airline Ticket Task Scenario

For the purpose of this study, please imagine yourself in the following situation (s):

For the Restaurant Choice Task:

You are a student in the Terry College of Business at the University of Georgia. You are the President of an organization named "Student Life", which arranges activities that provide students with opportunities to meet new people and make new friends from your campus as well as from other US Universities.

Two important meetings are coming up - one week apart from each other. There will approximately be eight people in each meeting. You have the responsibility of selecting a restaurant where the groups will meet for dinners. They will be sit-down affairs. The menus have to be identical for both occasions. You want to search for a restaurant which serves Italian food.

*There are several restaurants offering a variety of menu choices. You will have to select **ONE** full menu that will be used for both occasions. In other words, you will have to select **ANY ONE** full menu from the various restaurants that you review in the following sections.*

*To search for and select a full menu **(not a menu item) for the dinners, you need to login (speak with an agent).*

*** The full menu consists of the following sections: Soup and salad, Appetizer, Entrée, Deserts and Beverages. Each menu card contains information on all these.*

Figure 11: Restaurant Task Scenario

In Experiment 2, every participant performs tasks that have the same level of complexity (in different search modes). There is a gap of one month between the two search tasks that are completed by each participant. The order of the tasks is randomized. The steps that participants will go through in each search task is presented in Figure 12.

The general layout of the two experiments is provided in Table 39 (Also see Figure 13). Pretests and manipulation checks are conducted in order to verify that participants perceive each task as representing a distinct level of complexity, which is different from each other.

EXPERIMENT 1

This section discusses all the experiments. The measures of the dependent variables, control variables, covariates, procedural designs, test stimuli, analyses and results are discussed here for all the experiments.

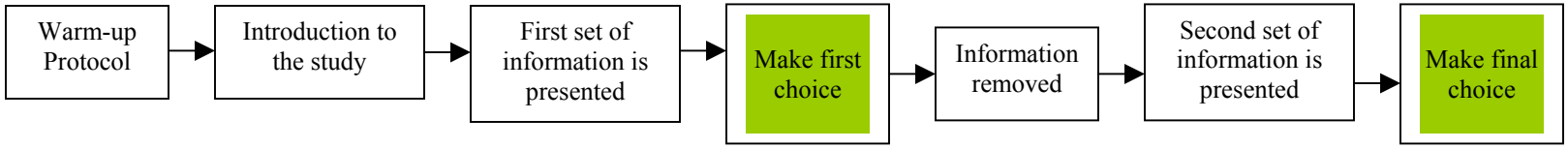
Design of Experiment

Experiment 1 is a **3 x 3 between-subjects design**, where each of the two factors has three levels (e.g., **Search Mode** has three levels: M-Commerce, E-Commerce, In-Store; **Task Type** also has three levels: simple → complex). Participants are randomly assigned to one of the nine cells, where each participant carries out one task. to undertake a search task.

Measures of Dependent Variables

For undertaking the search tasks, the information is presented to participants in the form of **brands** and **options**. Each brand has five options. The following are measured for *each* task:

1) Total amount of search is measured as the number of times a particular brand *and* option are accessed.
    a. In the "in-store" mode, a count was kept of the number of brands *and* options that each participant consults before making a decision.



Once participants begin the session, they are provided instructions for completing each search task. Each task follows the same sequence.

First, information on a set of brands is made available. A list of the brand names are provided. In order to access information on the associated attributes, individual brands have to be accessed one at a time. Participants are allowed to access as much (or as little) information about each brand as they want. Then they are asked to make a choice based on this information.

Next, this set of information is no longer made available to the participants. New information on a different set of brands (and attributes) are made available, which the participants are asked to access. Presentation format and rules for accessing information are the same on both occasions. Finally, when participants are ready, they are asked to make a choice. Participants are instructed that for making the final choice they are free to *also* consider the information that they came across during the first choice task.

Figure 12: Individual Search Task

Table 39: Specific Tasks

Task Type / Search Mode	Few Alternatives (**Simple**)	More Alternatives (**Not-So-Simple**)	Many Alternatives (**More Complex**)
	Airlines Task *and* Restaurant Task	Airlines Task *and* Restaurant Task	Airlines Task *and* Restaurant Task
M-Commerce (Wireless PDA)			
E-Commerce			
In-Store			

Experiment 1

- Each participant completes one search task **(Mode of Search:** Between factor; **Task Type:** Between factor**)**
- Each task will require participants to choose the best option (make a decision) given the ***search mode*** and the ***task type***.

Experiment 2

- Each participant completes two search task **(Mode of Search:** With-in factor; **Task Type:** Between factor**)**
- Each task will require participants to choose the best option (make a decision) given the ***search mode*** and the ***task type***.
- The task sequence for a typical participant is:

Task 1 → One Month → Task 2

For Study 1 (Between Subjects Design), the following procedure is followed

For Study 2 (Mixed Design), the procedure remains the same. An individual undertakes the same study with a month's time difference between the two tasks.
MODE is different for each individual on the two occasions
(TASK COMPLEXITY remains the same).

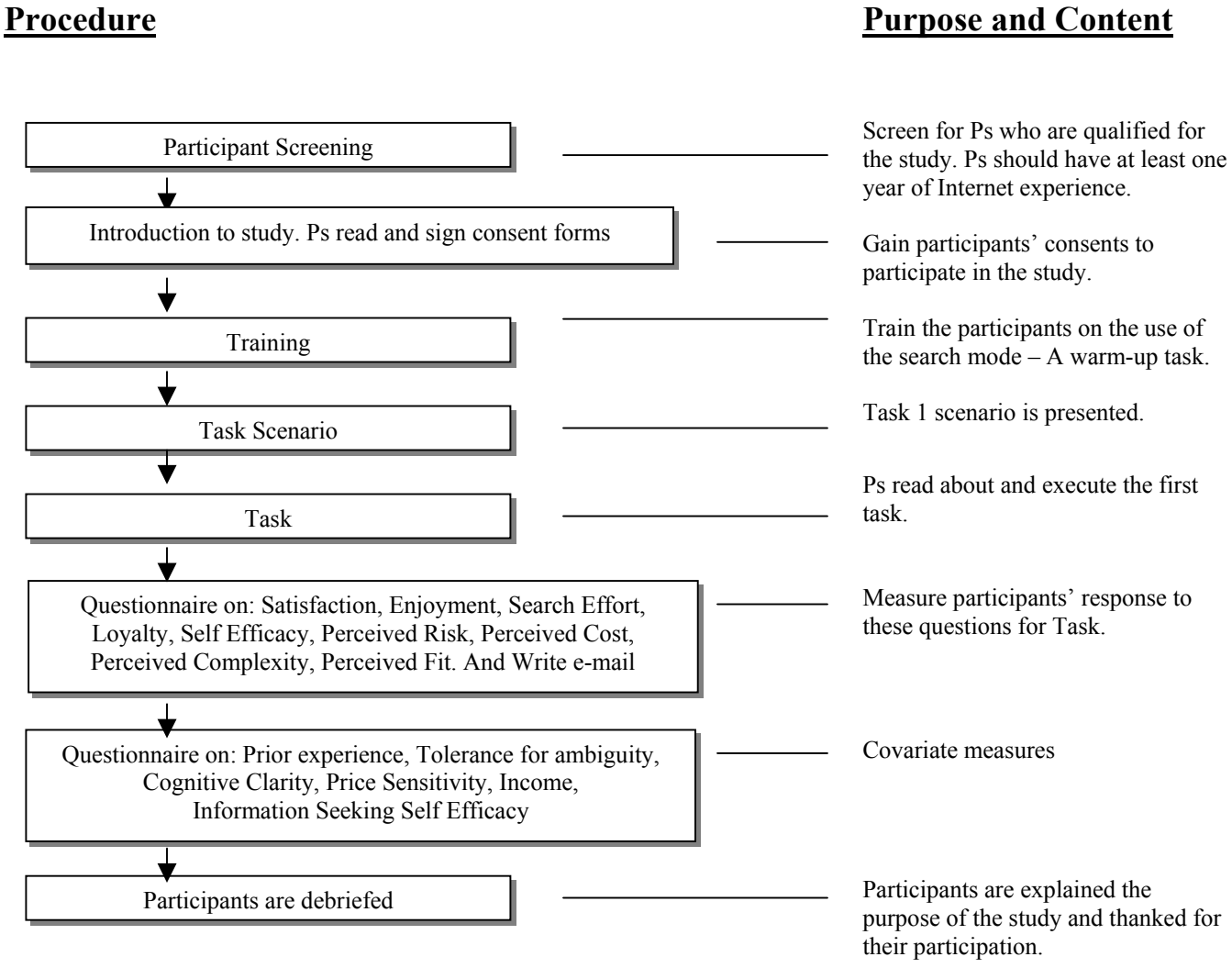


Figure 13: Experimental Procedure (Individual Participant)

i. Number of brands accessed: Participants examine the information on *each* brand that they want to review. A count of the number of brands reviewed by the participants is maintained.

ii. Number of options accessed: Each brand has five options. A separate card is devoted to each option – therefore, there are five pages for each brand. For e.g., if a participant wants to review two options, two separate cards (each listing respective attributes for that option), are given to the participant for inspection. Participants can access each information as many times as they want, but only one option can be inspected at a time. This is the case *even when* participants want to inspect an option more than once. A count of the number of times that each sheet is re-inspected is maintained. The participant stops accessing information whenever s/he feels s/he has enough information to make a choice regarding which option to choose.

b. In the "e-commerce" and "m-commerce" modes, the number of brands *and* options accessed are tracked through the "clicks" made to access the information associated with each brand and option.

2) Time required to complete the search task is marked. This is measured in number of minutes and seconds.

3) Consideration set is measured by asking participants how many and what options are taken into consideration before a choice is made. A checklist is

given to the participants (e.g., Shapiro, Macinnis and Heckler (1997)) after the search task is completed.

4) Choice is performed by participants in the experiments. There are two choices per task (See Figure 6).

5) Satisfaction is measured through already available validated scales (Westbrook and Oliver (1991)).

6) Enjoyment is measured through already available validated scales (Davis et al. 1992).

7) Search Effort (Extent of Search) is also measured through an existing validated scale by Heaney and Goldsmith (1999)).

8) Loyalty is a self-reported indication of the participant's intention of undertaking the same search task in that particular search mode in the future.

9) Word-of-Mouth is a communication exercise undertaken by participants after the completion of the search task, where they each send a written note (in the form of an e-mail) about their search experiences to a friend.

Control Variables

There is one control variable in the experiment. **Format of information presentation** (Bettamn and Kakkar 1977) is the format in which information is presented to participants. This is kept the same for *all search tasks* across all three *search modes* to ensure that there is no confounding effect arising from format.

Covariates

The covariates in the experiment are *perceived risk*, *perceived cost*, *prior experience*, *tolerance for ambiguity* (Budner 1962), one demographic variables (e.g., *income*) (e.g., Engel et

al., 1973; Claxton et al. 1974; Newman and Staelin 1972) *need-for-cognitive clarity* (Cox 1967), *information seeking self efficacy* (Provost 2004) and *price sensitivity* (Goldsmith 1996). The covariates are measured for every participant:

1) Perceived Risk is measured through validated scales already available (Heany and Goldsmith 1999).
2) Perceived Cost is measured through validated scales already available (Srinivasan and Ratchford 1991).
3) Prior experience (Jacoby, et al. 1978; Moore and Lehmann 1980) is operationalized by making sure that the participants who are included in the study have sufficient amount of exposure to the Internet. Only those participants are included in the study who have been using the Internet regularly for at least one year *and* who have conducted at least one monetary transaction on the Web.
4) Tolerance for ambiguity is measured through validated scales already available (Budner 1962).
5) Income is measured in 1000's of US dollars.
6) Need for cognitive clarity is measured through validated scales already available (Cox 1967).
7) Information seeking self efficacy is measured through validated scales already available (Provost 2004).
8) Price sensitivity is measured through the PSS which is the price sensitivity scale (Goldsmith 1996).

Experimental Procedure (Task)

The procedures followed to complete this laboratory experiment are described here. The experimental procedure consists of the following steps also laid out in Figure 7 (See above).

a. Participants are randomly assigned to one of the nine cells, where each participant is required to undertake one search task (since this is a 3 x 3 between-subjects design). Then, each participant undergoes a training session where s/he is given an explanation about the characteristics of the mode of search (to which s/he has been assigned) and about the features available that s/he can use while conducting the search.
b. Next, every participant is presented with a task (see Figures 4 and 5). Two different search tasks are designed for the experiment – a participant undertakes *any one* of the tasks.
    i. After the completion of the task, participants are asked to fill out a questionnaire on satisfaction, enjoyment, perceived effort, loyalty and self efficacy. They are also asked to write an e-mail to a friend regarding their decision-making experiences.
    ii. Manipulation check questions (on perceived cost, perceived risk and perceived complexity) are answered after every task.
    iii. A total time of approximately half an hour is needed for the completion of the each task.
c. After the completion of all tasks, participants are asked to provide information on prior experience, tolerance for ambiguity, income, price sensitivity and need for cognitive clarity and answer a few more questions.

d. Subjects are thanked for their participation.

Pretest

39 undergraduate Business majors from a major south-eastern university participated in the pretest. Pretests are conducted before the final experiment to check for: perceived level of complexity, perceived difference among modes,

a) Perceived differences among the levels of complexity: Pre-test is done with 5 levels of complexity. The results show that there are no significant differences between:
    a. Levels I and II
        i. Amount of information: Mean (I) – 17.34; Mean (II) – 17.98; sig. 0.56), and
    b. Levels IV and V
        i. Amount of information: Mean (IV) – 35.02; Mean (V) – 34.89; sig. 0.29).

Based on these results, the number of levels of complexity in the experiments were reduced from five to three.

b) The feasibility and suitability of the tasks (Scales from Mitra, et. al, 1999): All participants agree that the tasks (choosing an airlines ticket *and* choosing a restaurant for a group of friends) are "real" – in other words, all participants indicate that either they have already encountered *or* were likely to encounter such situations in real life.
c) The feasibility and suitability of the search modes (Media Richness, Perceived Cost and Perceived Risk) (MR – Scales from Suh 1999) – The three modes, in-store, e-commerce, m-commerce display significant difference (p value < .05) on all three criteria.

Stimului

Two types of search tasks are designed for this experiment, i.e., the search tasks that participants undertake are in two product categories: **search** and **experience**. The two tasks are comparable, and each participant undertakes only ONE search task each:

Task 1: *Search for an airlines ticket* (search) OR

Task 2: *Plan dinner for a group* (experience)

When developing the stimuli, special attention was given to make the experience of the participants as real-world as possible. The list of airlines tickets that are provided to the participants is obtained from the output generated for specific dates from www.orbitz.com. The flight tickets were ordered in the same manner as is available on that Website. The information was provided for each round-trip flight. Each set includes information on the time of departure (from Atlanta, GA) and the time of arrival (at Cancun, Mexico), number of connecting flights, number of hours and minutes between the connecting flights, and the cities where these connections are.

Similarly, the list of restaurant menus that are provided to the participants is obtained from www.delivery.com. Each menu consists of five separate sections: appetizers, soup and salad, entrée, dessert and beverages. The base materials for the stimuli are taken from existing Websites so as to enable participants undergo experiences that they would be subjected to if they visited similar Websites that are currently available.

Once the list of airlines tickets and menus are obtained, printed material was prepared (for in-store environment) and Websites were created (for e-commerce and m-commerce modes). To control for confounds, special care is taken to keep the color scheme, wording, layout, text, pictures, font etc. the same throughout the stimuli for the different environments.

Each task has 3 levels of complexity. The levels of complexity are manipulated by altering the *number of brands* and *options* that each participant has to take into consideration when undertaking the search task. "Increasing levels of complexity" is operationalized by increasing the number of brands (from 4 to 20, over three levels) and options (from 20 to 100, over three levels) presented to participants. For each task, participants are presented with the following number of brands and options:

Level I – Simple: 4 Brands; 20 options;

Level II – Not-So-Simple: 12 Brands; 60 options;

Level III – Complex: 20 Brands; 100 options;

Data Collection

a) For the in-store environment, a confederate is appointed who poses as a travel agent or a concierge. E.g., participants walk in to an office and interact with a confederate in order to complete the task.

b) For the e-commerce environment, everything is made available online. Separate screens hold information on separate brands. The tasks are completed online by logging on to respective Websites via a computer.

c) For the m-commerce environment, the same Websites that are accessed in the e-commerce environment, are used. The two main differences are:

   a. Information processing is done through a smaller screen (of the PDA) and
   b. Participants carry out the tasks in the corridors outside classrooms, in the business school, using the wireless network inside the business school. The tasks are completed online by logging on to respective Websites via a PDA.

Once participants begin the session, they are provided with instructions to complete each search task. First, information on a set of brands and options (and their attributes) are made available to the participant (This set is referred to here as SET 1). S/he is told to access as much (or as little) information about each option as s/he wants to and make a FIRST choice based on these information.

Next, this set of information is no longer made available to the participants. A new set of information on a different set of brands (and options) are made available, which the participants are allowed to access (This set is referred to here as SET 2). Finally, when they are ready, they are asked to make a FINAL choice. They are further told that they are allowed to take ALL the information that they have come across so far into consideration for making the final choice. In other words, when making the final choice, participants can choose any brand option from *either* SET 1 *or* SET 2. This is done in order to explore if there is any difference in stimulus and memory processing.

Sample

Voluntary participation from undergraduate students registered as business majors at a major south-eastern university in the United States, is solicited. Subjects are offered extra credit for taking part in the experiments. Further, all the students are entered into five raffle drawings of US$ 30.00 each. The search tasks that they undertake are representative of the kinds of tasks that a student might typically undertake. Therefore, though student subjects are used in this experiment, there is limited possibility of bias being associated because of student samples.

173 (the 39 who participated in the pre-test are not included in this) volunteers signed up for the study. Of those who signed up, 168 participated in the experiment. Of the 168 participants, 3 of those who were assigned to the m-commerce mode, lost connectivity during the

course of the experiment, 2 did not complete the study and 1 could not begin the study due to unavailability of network. Thus, usable data were obtained for 162 participants.

Of the 162 participants, all are under 30 years of age (18 – 27). The mean age is 20.7 years, with mode 20 years. 53.1% are females; 35.2% have a family income of over a hundred thousand US$ and 85.2% are Caucasian Americans.

Analysis

Test of Dimensionality

The majority of our measures are established, multi-item scales (Examples of some scales used in this experiment are listed in Table 40), we employed exploratory factor analysis (EFA) to assess the dimensionality of the measures of *involvement, attention, satisfaction, perceived enjoyment, search effort, perceived cost, perceived complexity, perceived fit, role of memory, media richness, loyalty, self efficacy of information search, perceived risk, service type, prior experience, tolerance of ambiguity, price sensitivity, perceived difference among the modes, cognitive clarity and task relevancy* in the search task. Using a principal components procedure, this analysis reveals that excepting for satisfaction (3 components), perceived cost (2 components), role of memory (2 components), prior experience (2 components), price sensitivity (2 components), task relevancy (2 components), all the other scales strongly load on a single factor. Factor loadings for each construct are shown in Table 41. Instead of using original individual items, we combine several items to form composite indicators and use factor scores for later data analysis.

In the factor loadings table (Table 41), if the columns are empty for a certain factor, it does not mean that there are missing values. Rather, it indicates that the number of columns presented are the number of factors that have been extracted for that variable. For example, the

variable involvement has factor loadings only in one column: this means that only one factor was extracted for the variable. In contrast, the variable satisfaction has three columns of factor loadings, meaning that three factors were extracted for this variable.

Testing of Competing Hypotheses

An analysis of the between-subjects effects indicate that both the manipulated factors – mode of search and task type have significant (p-value < 0.05) main effects on consumer information search behavior. The interactions, however, are not significant. This section contains a discussion on the hypotheses. Peter and Sawyer (1983) suggest the maximum acceptable p-value is .05.

Manipulation Checks

Participants answered manipulation check questions for perceived cost, perceived risk, perceived complexity and perceived difference among three modes after completion of the search task. One-way ANOVA for each manipulation check indicates that participants perceive the different modes of search as being different from each other – perceived cost ($F_{2,153}$= 10.070; p-value < .001); perceived complexity ($F_{2,153}$ = 4.994; p-value < .01) and perceived risk ($F_{2,153}$ = 3.139; p-value < .05). Similarly, for task type, perceived cost across the three levels of complexity is found as being significant ($F_{2,153}$ = 4.331; p-value < .01).

Table 40: Examples of Some Multi-Item scales in the Experiment

PERCEIVED RISK Heaney and Goldsmith (1999)
"Using the e-commerce environment for search does not inconvenience me."
"Using the e-commerce environment may lead to adverse consequences."
"It is probable that using the e-commerce environment could lead to negative consequences."
"I feel that there are uncertainties involved when making a decision in the e-commerce environment."
PRICE SENSITIVITY Goldsmith (1996)
"In general, the price or cost of buying is important to me."
"I am less willing to buy a product if I think that it will be high in price."
"A really good product is worth paying a lot of money for."
"I don't mind spending a lot of money to buy a product."
PERCEIVED ENJOYMENT Davis, et. al (1992)
"I had fun interacting with the e-commerce environment."
"Using the e-commerce environment provided me with a lot of enjoyment."
"I enjoyed using a the e-commerce environment."

Table 41: Factor Analysis Loadings

Variables	Component 1	Component 2	Component 3	Component 4	Extraction Sums of Squared Loadings Eigen Values (> 1)	% of Variance	Cumulative %
Involvement	.819				2.82	56.44	56.44
5 items	.762						
One Factor Extracted	.842						
	.685						
	.627						
Attention	.852				2.23	55.87	55.87
4 items	.837						
One Factor Extracted	.438						
	.785						
Satisfaction	.645	.461	-.419		3.26	40.78	40.78
8 items	.609	.414	-.532		1.35	16.98	57.77
Three Factors Extracted	.621	.128	.476		1.13	14.13	71.90
	.709	.245	.228				
	.533	.366	.532				
	.691	-.513	-.173				
	.603	-.488	.191				
	.680	-.513	-.208				
Perceived Enjoyment	.930				2.65	88.57	88.57
3 items	.952						
One Factor Extracted	.942						
Search Effort	.899				1.77	59.06	59.06
3 items	.912						
One Factor Extracted	-.365						

Variables	Component 1	Component 2	Component 3	Component 4	Extraction Sums of Squared Loadings		
					Eigen Values (> 1)	% of Variance	Cumulative %
Perceived Cost	.712	.638			2.95	59.16	59.16
5 items	.692	.662			1.28	25.71	84.88
Two Factors Extracted	.809	-.262					
	.834	-.428					
	.790	-.434					
Perceived Complexity	.890				2.46	82.25	82.25
3 items	.948						
One Factor Extracted	.881						
Perceived Fit	.985				1.94	97.03	97.03
2 items	.985						
One Factor Extracted							
Memory	.722	-.566			2.04	51.21	51.21
4 items	.614	.643			1.16	29.17	80.38
Two Factors Extracted	.713	.499					
	.800	-.428					
Media Richness	.803				3.71	61.93	61.93
6 items	.552						
One Factor Extracted	.803						
	.895						
	.797						
	.827						
Loyalty	.970				1.88	94.18	94.18
2 items	.970						
One Factor Extracted							

Variables	Component 1	Component 2	Component 3	Component 4	Extraction Sums of Squared Loadings		
					Eigen Values (> 1)	% of Variance	Cumulative %
Self Efficacy (Search)	.819				3.64	72.94	72.94
5 items	.929						
One Factor Extracted	.918						
	.670						
	.907						
Perceived Risk	.611				2.28	57.16	57.16
4 items	.874						
One Factor Extracted	.879						
	.614						
Service Type	.622				1.65	55.02	55.02
3 items	.807						
One Factor Extracted	-.783						
Prior Experience	.848	-4.894^{-02}			3.38	48.40	48.40
7 items	.785	.478			1.50	21.46	69.86
Two Factors Extracted	.724	.513					
	.564	-.596					
	.206	.624					
	.660	-.460					
	.856	-.228					
Tolerance of Ambiguity	.787				1.71	42.89	42.89
4 items	.750						
Two Factors Extracted	.702						
	.200						

Variables	Component 1	Component 2	Component 3	Component 4	Extraction Sums of Squared Loadings Eigen Values (> 1)	% of Variance	Cumulative %
Price Sensitivity	.744	.470			1.89	47.40	47.40
4 items	.855	.260			1.21	30.45	77.86
Two Factors Extracted	-.289	.855					
	.726	-.447					
Perceived Difference	.675	-.440			1.95	39.06	39.06
(Among Modes)	.798	.256			1.01	20.19	59.25
5 items	.454	.563					
Two Factor Extracted	.602	.269					
	.540	-.601					
Cognitive Clarity	7.088^{-02}	-.434	.234	.710	2.35	29.44	29.44
8 items	.322	.431	.307	.627	1.43	17.97	47.41
Four Factors Extracted	-.581	.253	-.651	.240	1.15	14.42	61.84
	.745	-.327	.248	-.315	1.09	13.71	75.55
	-.813	-.236	.378	-.111			
	.643	.574	-7.831^{-02}	-6.130^{-02}			
	.522	-.443	-.588	.116			
	-8.488^{-02}	.559	.160	-.118			
Task	-.234	.870			2.25	45.06	45.06
5 items	.708	-.503			1.23	24.70	69.76
Two Factors Extracted	.422	-5.590^{-02}					
	.867	.334					
	.876	.334					

Extraction Method: Principal Component Analysis.

The results for perceived difference among the three modes, as presented in the table below (Table 42), indicate that participants perceive an in-store environment as being quite different from an e-commerce (p-value < .05) as well as an m-commerce (p-value < .001) environment. However, though they do not think that there was any significant difference between the e-commerce and m-commerce modes (p-value > .05), it is apparent from the discussion above that there are significant differences in search patterns between these two modes. Moreover, the results for media richness indicates that e-commerce (Confidence Interval for mean: 2.34 – 3.18) (See Table 43) and m-commerce (Confidence Interval for mean: 3.95 – 4.97) are seen as being significantly different from each other in terms of aiding in decision-making. Therefore, the results for perceived difference among modes of search and media richness, indicate that the three modes of search are perceived as being significantly different from each other.

The extent of involvement in the search tasks was also significant. In replying to questions about how important, relevant, of concern, interesting and valuable the task was, participants indicate their average involvement as being 3.685 (p-value < .05) on a scale of 1 – 7 (e.g., 1= important; 7 = not important). Participants also indicated that they were concentrating on the task at hand, with 2.69 (p-value < .001) being the score on a scale of 1 to 7 (1 = fully concentrating; 7 = not concentrating). Further, subjects were also asked to guess the actual purpose of the study. None of the participants were correctly able to guess the purpose of the study.

Table 42: ANOVA – Perceived Difference Among the Modes of Search: Manipulation Check

Modes	df	$F_{2,153}$	Sig.
PDA-In-Store	2	13.143	<.001
In-Store/E-Com	2	2.825	<.05
E-Com-M-Com	2	.542	>.05

Table 43: Media Richness: Manipulation Check

	Mode	n	Mean	95% Confidence Interval for Mean	
				Lower Bound	Upper Bound
Helps me make a good decision	In-Store	54	2.50	2.14	2.86
	E-Com	54	2.76	**2.34**	**3.18**
	M-Com	54	4.46	**3.95**	**4.97**
Makes it easy for me to come to a decision	In-Store	54	2.91	2.51	3.31
	E-Com	54	3.04	**2.62**	**3.45**
	M-Com	54	4.80	**4.32**	**5.28**
Easily understand things	In-Store	54	2.22	1.93	2.52
	E-Com	54	2.72	**2.40**	**3.04**
	M-Com	54	3.93	**3.43**	**4.43**

Hypotheses for Search Mode

An analysis of the marginal means of the number of brands (1st choice) searched for on each mode of search (Figure 14(a): In-Store: 5.019; E-Com: 6.944; M-Com: 5.907; p-value < .01) finds support for Hypothesis 1. This is more strongly borne out in the total number of brands searched (In-Store: 9.944; E-Com: 12.556; M-Com: 9.833; p-value < .01). The total amount of information searched, therefore, follows an inverted U-shaped curve, suggesting that predictions made using cost theory holds in this case. Moreover, the total number of options searched for (1st choice), decreases from richer to leaner medium (Figure 14(b): In-Store: 22.833; E-Com: 20.463; M-Com: 16.111; p-value < .05), also in total number of options searched (In-Store: 44.815; E-Com: 37.481; M-Com: 25.852; p-value < .001). This further lends support to cost theory.

An interesting finding is that participants in the m-commerce manipulation search for the least amount of information, even though the time spent (for 1st choice, in seconds) on the various modes are not significantly different (Figure 14(c): In-Store: 529.611; E-Com: 499.093; M-Com: 537.000; p-value > .05). Also, the time spent follows a U-shaped (and not an inverted-U shaped) curve. Hence, no support is found for hypothesis 2.

Further, search behavior with-in each mode follow different patterns, suggesting that the mode itself affects search behavior differently:

a) In-store behavior follows an inverted-U shaped curve (Figure 14(d): Simple: 322.611; Not-So-Simple: 705.944; Complex: 560.278; p-value < .001)
b) In the e-commerce behavior follows an inverted-U shaped curve (Figure 14(d): Simple: 419.889; Not-So-Simple: 622.944; Complex: 454.444; p-value < .001)
c) The search pattern follows a straight curve in the M-commerce mode (Figure 14(d): Simple: 393.833; Not-So-Simple: 544.556; Complex: 672.611; p-value < .001)

Figure 14(a)

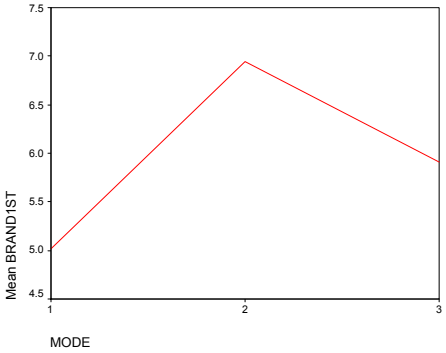


Figure 14(b)

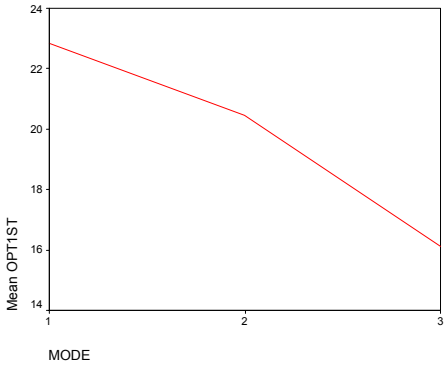


Figure 14(c)

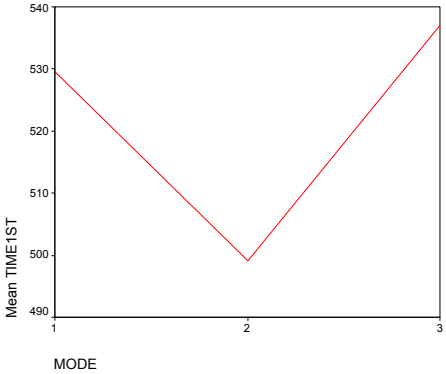


Figure 14(d)

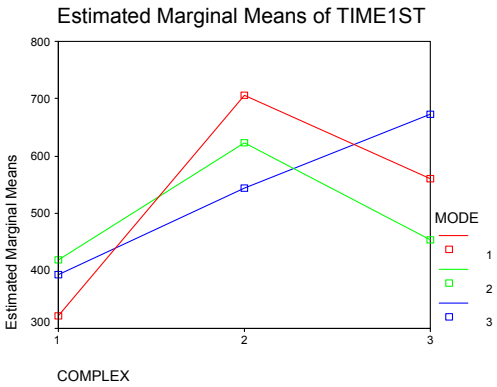


Figure 14: Marginal Means: Modes of Search

Index: Category Axis: 1 = In-Store; 2 = E-Com; 3 = M-Com

The process of how the second choice is made by the participants is particularly interesting, as this provides a scope for furthering our understanding of the effects of modes of search. As can be seen (Table 44), mode of search has a significant effect on the time taken for 2^{nd} choice ($F_{2,153}$=4.826, p-value < .01), number of brands considered for 2^{nd} choice ($F_{2,153}$=6.976, p-value .002), and number of options considered for 2^{nd} ($F_{2,153}$=14.892, p-value < .01).

We are further interested in specifically locating differences, if any, in the way in which information is processed for the second choice. This will shed light on whether memory processing or stimulus processing occurs in each of the modes. Participants in the m-commerce manipulation show processing of a distinctly lower number of alternatives (Table 45) right before making the second choice (p-value < .01).

Further (as mentioned earlier), after the search task participants were asked which set, among the two sets of information, they relied on MORE before making the second choice. In other words, they were asked whether they concentrated more on the information presented to them the first time or on the information presented to them the second time. Participants in the m-commerce manipulation strongly suggested that they relied more on the first set compared to participants in the in-store manipulation, who indicated that they relied more on the second set of information presented to them ($\chi 2_{12}$ = 19.95, p-value < 0.01). Therefore, there is a strong indication that for participants in the m-commerce manipulation, memory processing is stronger than stimulus processing and for those in a richer medium (i.e., in-store), stimulus processing is greater than memory processing. Results for Tukey's HSD (See Table 46) is also provided to show that there is a greater emphasis on memory processing in the m-commerce manipulation than in the other two.

Table 44: Within Analysis for *Mode* and *Complexity*

Factor	Dependent Variable	df	$F_{2,153}$	Sig.
MODE	Time taken for 1st Choice	2	.210	>.05
	Time taken for 2nd Choice	2	4.826	<.01
	Total Time Taken	2	110.657	<.001
	Total Decision Time	2	2.121	>.05
	No. of Brands – 1st Choice	2	5.137	<.01
	No. of Options – 1st Choice	2	3.803	<.05
	No. of Pages – 1st Choice	2	79.988	<.001
	No. of Brands – 2nd Choice	2	6.576	<.001
	No. of Options – 2nd Choice	2	14.892	<.001
	No. of Pages – 2nd Choice	2	95.543	<.001
	No. of Brands – Total	2	5.211	<.01
	No. of Options – Total	2	9.734	<.001
	No. of Pages – Total	2	116.304	<.001
COMPLEX	Time taken for 1	2		<.001
	Time taken for 2nd Choice	2	4.146	<.05
	Total Time Taken	2	7.977	<.001
	Total Decision Time	2	9.370	<.001
	No. of Brands – 1st Choice	2	47.139	<.001
	No. of Options – 1st Choice	2	26.085	<.001
	No. of Pages – 1st Choice	2	32.167	<.001
	No. of Brands – 2nd Choice	2	52.593	<.001
	No. of Options – 2nd Choice	2	17.680	<.001
	No. of Pages – 2nd Choice	2	25.762	<.001
	No. of Brands – Total	2	60.829	<.001
		2		<.001
	No. of Pages – Total	2	37.765	<.001

Table 45: Number of Options – 2nd Choice

MODE	Mean	95% Confidence Interval	
		Lower Bound	Upper Bound
In-Store	21.981	18.830	25.133
E-Com	17.019	13.867	20.170
M-Com	9.741	6.589	12.893

Moreover, analyzing the actual choices made the second time, also supports the above. Clearly, more participants in the m-commerce manipulation preferred to retain their original choice than participants in the in-store manipulation (Figure 15: $\chi 2_2 = 3.916$, p-value < 0.05). Hence, hypotheses 3(a) is supported. Further, this finding also questions the usually accepted norm that consideration sets and decision-making are always memory driven.

Hypotheses for Task Type

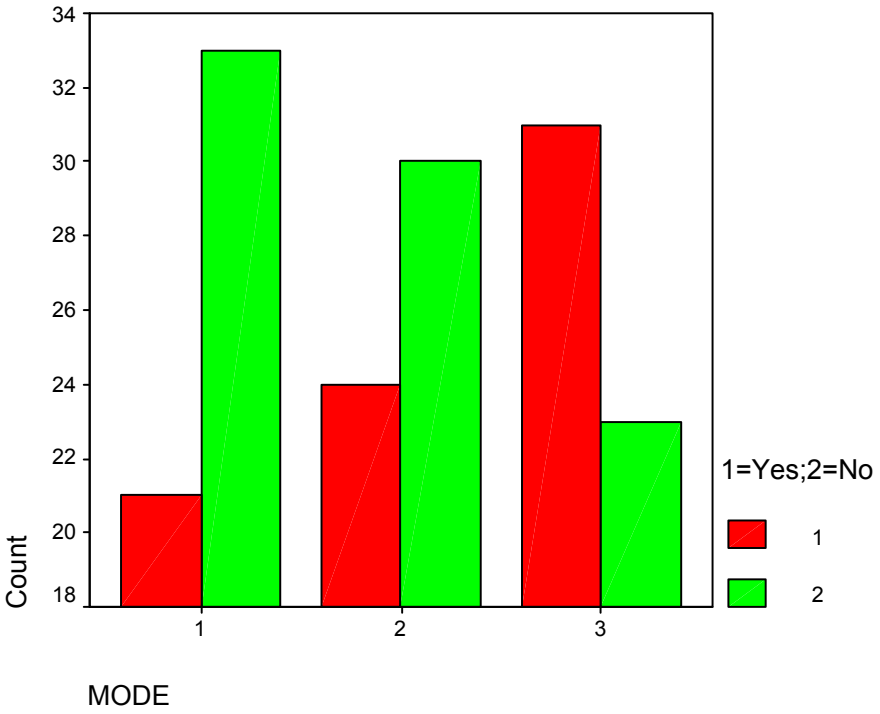
Task type is highly significant, with the number of brands (1st choice) searched for at different levels of complexity (Figure 16(a): Simple: 2.593; Not-So-Simple: 7.444; Complex: 7.833; p-value < .001) lending support to Hypothesis 5(b). This is strengthened by findings for total number of brands as well: (Simple: 4.815; Not-So-Simple: 12.741; Complex: 14.778; p-value < .001). The search curve continues to increase with the decreasing richness of the media, which might be indicative of heightened search due to heightened perceived risk. Moreover, the number of options searched for (1st choice), also increases (Figure 16(b): Simple: 9.500; Not-So-Simple: 24.611; Complex: 25.296; p-value < .001). This is also true for the total number of options searched: (Simple: 18.278; Not-So-Simple: 42.815; Complex: 47.056; p-value < .001). This further lends support to categorization theory.

However, the time taken (for 1st choice, in seconds) follows an inverted-U shaped curve (Figure 16(c): Simple: 378.778; Not-So-Simple: 624.481; Complex: 562.444; p-value < .001). This lends support to cost theory. Also, a different kind of behavior pattern is observed for each mode for each level of complexity. In the "simple" manipulation, the number of brands examined are not significantly different among the three modes. However, it is observed that as complexity increases, the number of brands examined dramatically increases (Figure 16(d)). The results of post-hoc Tukey's HSD are provided in the table (Table 47) below.

Table 46: Tukey HSD: Greatest Memory Processing in the M-commerce Manipulation

MODE	n	Subset	
		1	2
E-Com	54	2.57	
In-Store	54	3.04	
M-Com	54		4.19

Figure 15: Same/Different Choices Made in the Two Choice Tasks
(1=Same; 2=Different)



$\chi 2_2 = 3.916$, p-value < 0.05

Table 47: Tukey HSD: Brands Examined Increases as Complexity Increases

COMPLEX	n	Subset	
		1	2
In-Store	54	2.59	
E-Com	54		7.44
M-Com	54		7.83

Means for groups in homogeneous subsets are displayed. Based on Type III Sum of Squares The error term is Mean Square(Error) = 9.767.

a Uses Harmonic Mean Sample Size = 54.000.

b Alpha = .05.

Figure 16(a)

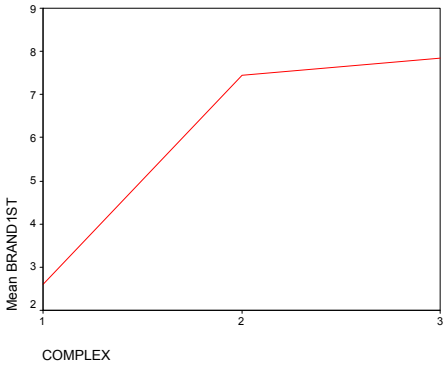


Figure 16(b)

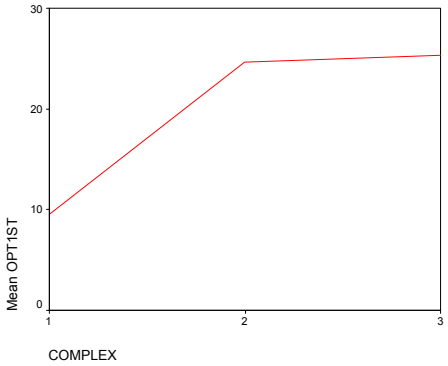


Figure 16(c)

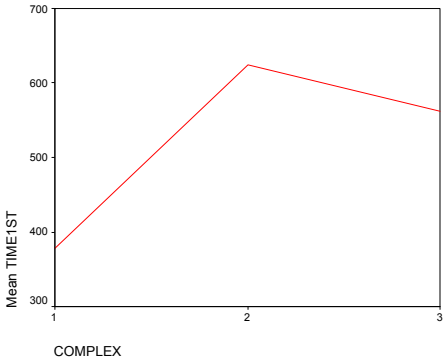


Figure 16(d)

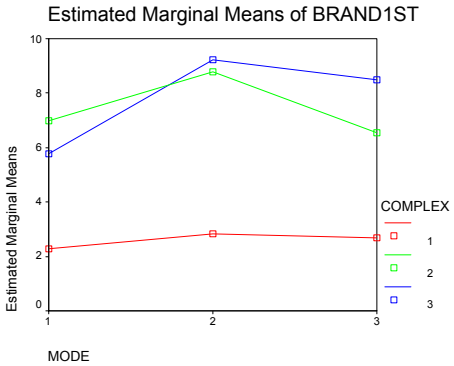


Figure 16: Marginal Means: Complexity

Index: Category Axis: 1 = Simple; 2 = Not-So-Simple; 3 = Complex

Hypotheses for Task Type – Mode of Search Fit

Questions are raised in the earlier section about the suitability of each mode for the search task that participants are given. After the task, participants are asked to assess the "fit" that a particular mode has with the task given. For assessing if task-mode fit is perceived by participants, in addition to "mode" and "task", "service type" is taken into consideration when carrying out the analysis. The results reported, are therefore, in terms of either a two-way or a three-factor ANOVA.

The factor mode of search is significant ($F_{2,153}$=69.503, p-value < .001; Factor scores: $F_{2,153}$=63.868, p-value < .001). The confidence intervals are provided (Table 48).

In the in-store and e-commerce manipulations, participants tend to perceive a higher "fit" between the task and the search mode. This "fit" is much lower in the m-commerce mode, where, the mean of 6.37 (on a scale of 1 to 7; 1=strongly agree and 7=strongly disagree) shows that participants in this mode of search tend to "disagree" that this mode is suitable for the task given. Recall that two different service categories (**Search**: Airlines; **Experience**: Restaurant) are used in the tasks that participants undertake[22]. Further, service type-mode interaction is significant ($F_{2,144}$=10.504, p-value < .001; Factor scores: $F_{2,144}$=9.594; p-value < .001), when "service type" is included in the analysis. The experience task (e.g., search for a restaurant, mean score[23]: In-Store: 2.444; E-Com: 3.556) is perceived as being more suited to the in-store environment, while the search task (e.g., search for an airlines ticket, mean score[24]: In-Store: 4.444; E-Com: 2.667), is perceived as being more suited to the e-commerce environment (Figure 17). None of the tasks are perceived as being particularly suited to m-commerce. Therefore,

[22] Though each participant completes one task, equal number of participants complete tasks in the two service categories.
[23] On a scale of 1 to 7; 1=strongly agree and 7=strongly disagree
[24] On a scale of 1 to 7; 1=strongly agree and 7=strongly disagree

hypothesis 4 is partially supported (Table 48). The other indicators of perceived fit are perceived enjoyment, satisfaction, effort and loyalty are examined next.

Perceived enjoyment for mode ($F_{2,144}$=3.116, p-value < .05) is significant. Further, mode-service type interaction is significant ($F_{2,144}$=10.546, p-value < .001; Factor Scores: $F_{2,144}$=8.733, p-value < .001). (See Figure 18 and Table 49).

Factor Analysis on Satisfaction result in three factors emerging from the eight-item scale that was used. Overall, two of the factors show significant difference among the modes of search.

a) The first factor is related to decision-making on a particular mode of search. This is significant for mode of search (Factor Scores: $F_{2,144}$=12.356, p-value < .001) and mode-service type interaction (Factor Scores: $F_{2,144}$=2.425, p-value <.05). Post-hoc tests (Tukey's HSD) indicate that decision-making in the given search tasks can would be undertaken in the in-store and e-commerce environments again, but not in the m-commerce environment. (Figure 19 and Table 49).
b) The second factor is about the participant's "feelings" about the decision-making task (Factor Scores: $F_{2,144}$=14.938, p-value < .001). Service type is significant (Factor Scores: $F_{2,144}$=2.901, p-value < .05).
c) The third factor is not significant.

Effort to search for more information is significantly different for the modes (Factor Scores: $F_{2,144}$=4.289, p-value <.05) as well as for task service-mode interaction ($F_{2,144}$=2.455, p-value < .05). (Figure 20 and Table 47). Loyalty is significantly different for mode ($F_{2,144}$=68.631, p-value < .001; Factor Scores: $F_{2,144}$=69.205, p-value < .001) and service type-mode interaction ($F_{2,144}$=4.434, p-value <.05; Factor scores: $F_{2,144}$=2.855, p-value < .05). (See Table 49)

Further, perceived complexity is greater for the "experience type" search task (e.g., restaurant: $F_{2,144}$=5.035, p-value < .01) than for the "search type" (e.g., airlines: $F_{2,144}$=5.102, p-value < .05) search task. All of the figures (17, 18, 19 an 20) suggest that participants indicated that they would prefer to carry out the experience task (i.e., search for a restaurant) in the in-store environment and the search task (i.e., search for an airlines ticket) in the e-commerce environment, while that m-commerce environment was not looked upon as being conducive for either of the two tasks. Task-mode fit was definitely perceived, as is indicated by the above findings. Therefore, there is overall support for hypotheses H4, H7, H8, H9 and H10.

Hypotheses for Covariates and Interaction

ANCOVA shows that perceived cost, prior experience, price sensitivity and cognitive clarity are significant for some of the dependent variables (Table 50). This provides support for Hypotheses 13, 16 and 18.

Perceived risk, tolerance of ambiguity, income and self efficacy for information search were found to be not significant. Therefore, no support was found for hypotheses 14, 15 and 17. Also, as mentioned earlier, the interaction between the two manipulated factors in the experiment (i.e., mode and task type) is not significant, leading to no support for hypotheses 19(a) or 19(b). Next, we discuss study 2, which is a mixed design. The purpose of the second experiment is to replicate the findings of experiment 1. This is a small study, limited in its scope and should be looked upon as replicating the findings of study 1.

Table 48: Perceived Task-Mode Fit for the Three Modes

MODE	Mean	95% Confidence Interval	
		Lower Bound	Upper Bound
In-Store	3.852	3.454	4.249
E-Com	2.741	2.343	3.138
M-Com	6.037	5.640	6.434

Figure 17: Experience Task Most Suited to In-Store Environment

1 = Airlines Task; 2 = Restaurant Task (For Figures 17 through 20)

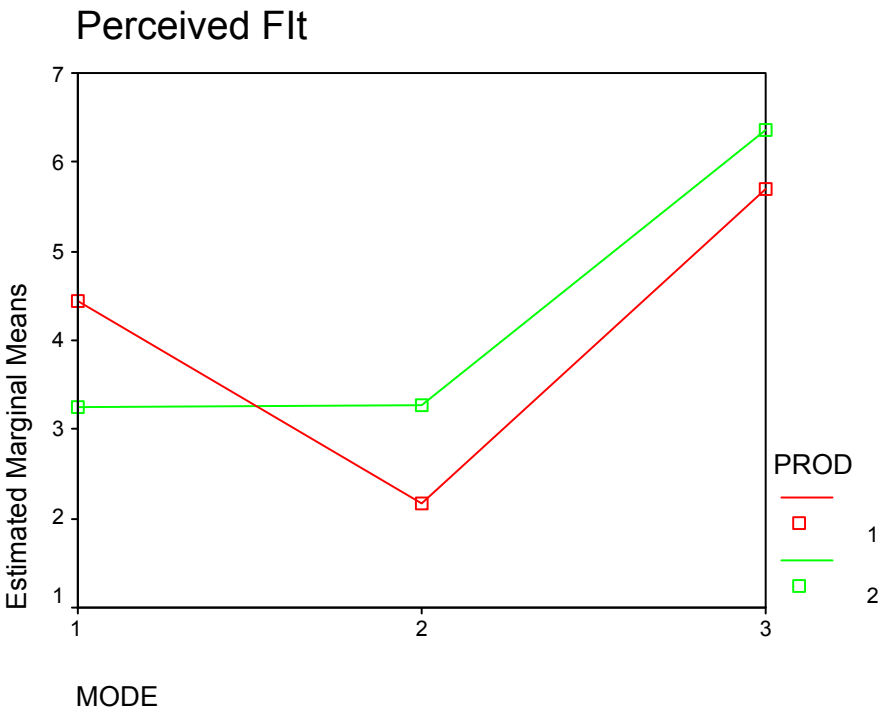


Figure 18: Perceived Enjoyment Highest in the In-Store Environment for Experience Task

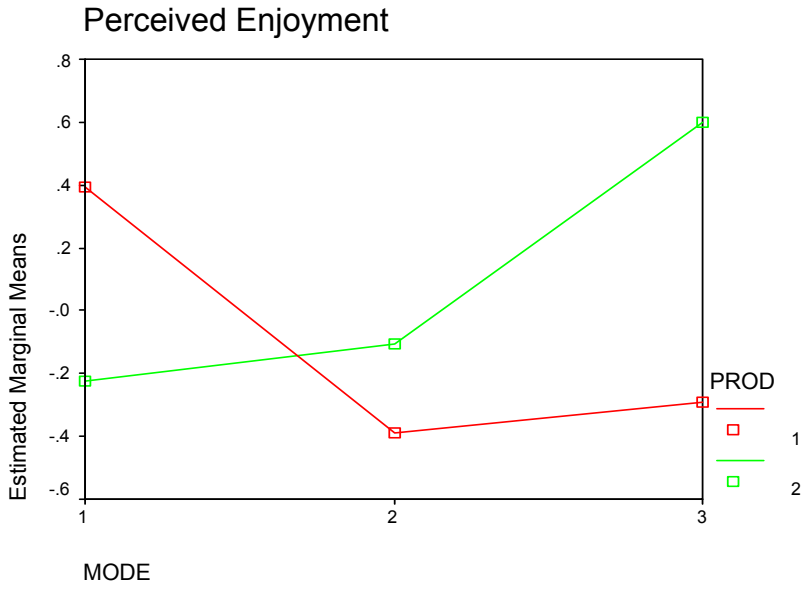


Figure 19: Satisfaction Highest in the In-Store Environment for Experience Task

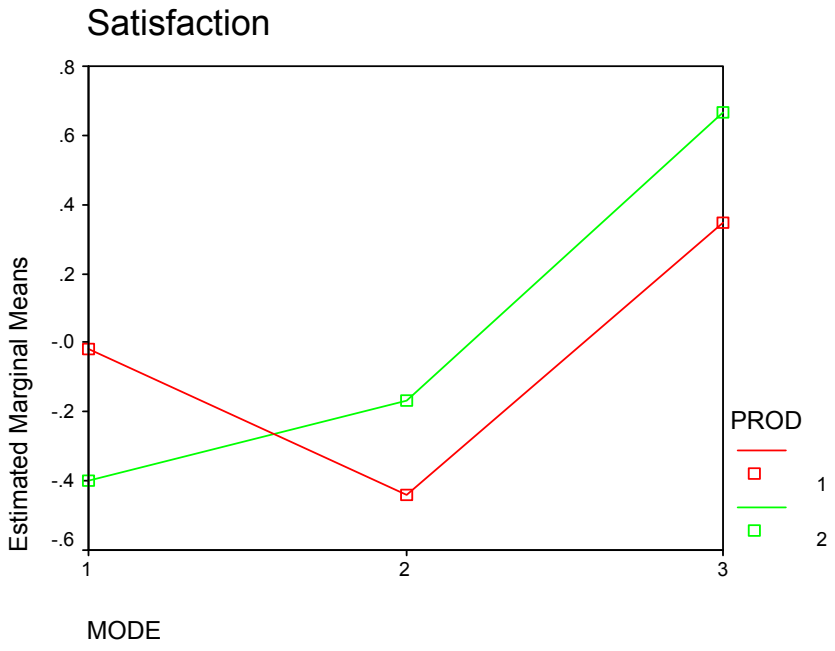


Figure 20: Search Effort Lowest in the In-Store Environment for Experience Task

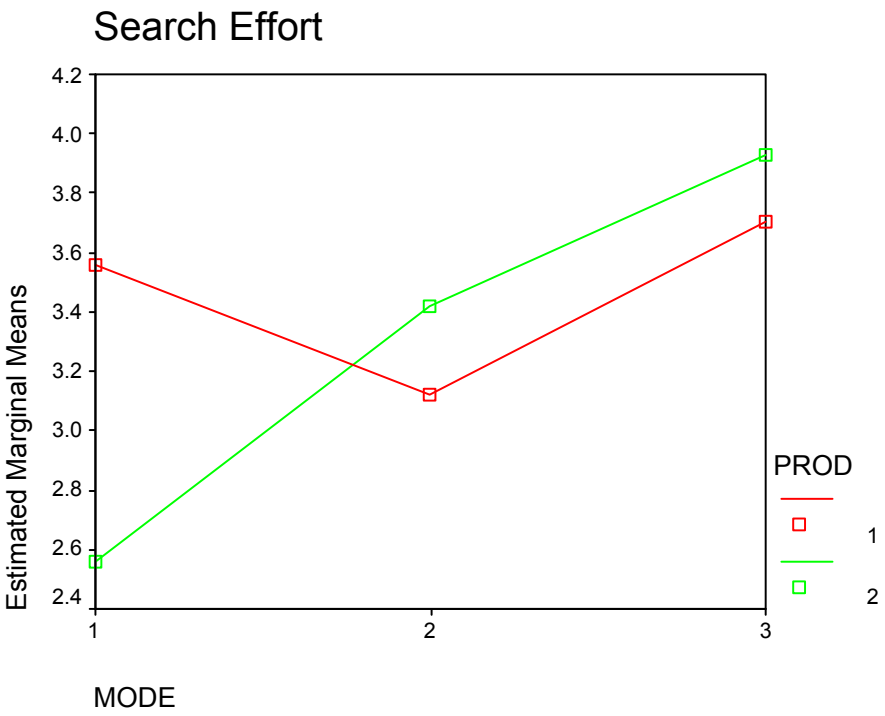


Table 49: Mode-Task Type Fit

Perceived Fit: $F_{2,144}$=10.504, p-value < .001
Enjoyment: $F_{2,144}$=10.546, p-value < .001
Satisfaction: $F_{2,144}$=2.425, p-value < .05
Effort: $F_{2,144}$=2.455, p-value < .05
Loyalty: $F_{2,144}$=4.434, p-value < .05

Service Type **Search Mode**	**Airlines**	**Restaurant**
M-Commerce (Wireless PDA)	**Under Fit** Perceived Fit: 5.65[25] Enjoyment: 3.037 Satisfaction: 4.19 Effort: 3.704 Loyalty: 5.074	**Under Fit** Perceived Fit: 6.37 Enjoyment: 4.889 Satisfaction: 4.84 Effort: 3.926 Loyalty: 6.222
E-Commerce	**Ideal Fit** Perceived Fit: 2.667 Enjoyment: 3.046 Effort: 3.120 Loyalty: 2.509	**Under Fit** Perceived Fit: 3.556 Enjoyment: 3.407 Satisfaction: 2.77 Effort: 3.422 Loyalty: 2.919
In-Store	**Over Fit** Perceived Fit: 4.444 Enjoyment: 4.148 Satisfaction: 3.43 Effort: 3.556 Loyalty: 3.037	**Ideal Fit** Perceived Fit: 2.444 Enjoyment: 3.259 Satisfaction: 3.11 Effort: 2.556 Loyalty: 2.481

[25] All reported values are each the mean on a scale of 1 to 7; 1=strongly agree and 7=strongly disagree

Table 50: Significant Covariates

Source	Dependent Variable	$F_{2,153}$	Sig.
Prior Experience		3.374	<.05
	Time taken for 2nd Choice		<.01
	Total Decision Time	7.551	<.01
	No. of Brands – 1st Choice	.463	>.05
	No. of Options – 1st Choice	.053	>.05
	No. of Pages – 1st Choice		<.05
	No. of Brands – 2nd Choice	1.279	>.05
	No. of Options – 2nd Choice	.022	>.05
	No. of Pages – 2nd Choice	.209	>.05
Price Sensitivity	Time taken for 1st Choice	5.327	<.05
	Time taken for 2nd Choice	.675	>.05
	Total Decision Time	.924	>.05
	No. of Brands – 1	5.772	
	No. of Options – 1st Choice	6.990	<.01
			<.001
		4.557	<.05
	No. of Options – 2	3.106	<.05
	No. of Pages – 2nd Choice		<.01
	No. of Brands – Total	6.635	<.05
	No. of Options – Total	5.848	<.05
	No. of Pages – Total	13.064	<.001
Cognitive Clarity	Time taken for 1st Choice	2.804	>.05
	Time taken for 2nd Choice	.007	>.05
	Total Decision Time	1.213	>.05
		5.252	<.05
	No. of Options – 1st Choice	1.259	>.05
		6.318	<.05
	No. of Brands – 2	6.372	<.05
		3.274	
		4.980	<.05
	No. of Brands – Total	7.270	<.01
	No. of Options – Total	2.490	>.05
	No. of Pages – Total	7.711	<.05
Perceived Cost	Time taken for 1st Choice	2.367	>.05
	Time taken for 2nd Choice	1.099	>.05
	Total Decision Time	5.495	<.05
		3.799	
	No. of Options – 1st Choice	.505	>.05
	No. of Pages – 1st Choice	1.327	>.05

	No. of Brands – 2nd Choice	6.103	<.05
		2.962	<.05
		4.592	<.05
	No. of Brands – Total	5.947	
	No. of Options – Total	1.668	>.05
	No. of Pages – Total	3.571	<.05

EXPERIMENT 2

Experiment 2 is a **2 x 3 mixed-subjects design**, where **search mode** has two levels and **task type**, as in experiment 1, has three levels:

a) **Search Mode** is the with-in factor, and the two levels are **<u>any two</u>** from the three levels: In-Store, E-Commerce and M-Commerce. In other words, each participant is not assigned to all three of the search modes – rather, each participant is assigned to <u>any of the two search modes</u>. The possible combination of the search modes are listed below:

   a. E-Commerce and M-Commerce
   b. E-Commerce and In-Store
   c. M-Commerce and In-Store

b) **Task Type** is the between factor, and also has three levels: simple → complex. Each participant is assigned to <u>any ONE of the three levels</u>.

Through the second experiment we attempt strengthening the findings of experiment 1. Dependent variables, control variables and covariates are the same and are measured in the same way as they are in experiment 1. The <u>procedures followed</u> with-in each task and the <u>stimuli used</u> are also the same as in experiment 1. The overall procedure is delineated below.

Experimental Procedure (Task)

Participants are randomly assigned to two of the nine cells, with each participant carrying out two tasks (in two separate cells). One task is carried out in each cell. The time gap between the two tasks is thirty days. The experimental procedure consists of the following steps (very similar to the procedure laid out for experiment 1, in Figure 7, See above).

1) Participants are randomly assigned to one of the three cells, where each participant is required to undertake search tasks in two different modes (since this is a 3 x 3 mixed-subjects design).
    a. Mode of Search (With-in subjects factor): E-Commerce and M-Commerce **OR** In-Store and E-Commerce **OR** E-Commerce and In-Store
    b. Task Type (Between subjects factor): The level of complexity remains the same for both tasks. One of the tasks is the airlines task and the other is the restaurant task.
    c. Then, each participant undergoes a training session where s/he is given an explanation about the characteristics of the two modes of search (to which s/he has been assigned) and about the features available that s/he can use while conducting the searches.
2) Next, every participant is presented with a task within each mode (see Figures 4 and 5). The two different search tasks that are designed for experiment 1 (as discussed in the previous section) are used in experiment 2 as well – a participant undertakes *BOTH* tasks – one in each mode, with an elapsed time of thirty days between the two tasks.
        i. After the completion of each of the tasks, participants are asked to fill out questionnaires on satisfaction, enjoyment, perceived effort, loyalty and self efficacy. They are also asked to write e-mails to friends regarding their decision-making experiences.

ii. Manipulation check questions (on perceived cost, perceived risk and perceived complexity) are answered after both tasks.

iii. A total time of approximately half an hour is needed for the completion of the each task.

3) After the completion of each task, participants are asked to provide information on prior experience, tolerance for ambiguity, income, price sensitivity and need for cognitive clarity and answer a few more questions.

4) Subjects are thanked for their participation.

Sample

The data collection procedure in experiment 2, with-in each mode is exactly the same as in experiment 1. Sample participation is sought in exactly the same manner as in the previous experiment.

34 volunteers (from those that participated in the first experiment) signed up for the study. 3 of those who signed up, did not complete their second assignment (i.e., these participants completed only one of the two search tasks). 31 participated in the both the modes that they were assigned to. All those who participated in both modes, completed the two tasks. Thus, usable data were obtained for 31 participants. 13 of these participants were assigned to the e-commerce and m-commerce cell, 14 were assigned to the in-store and e-commerce cell and 4 were assigned to the in-store and m-commerce cell.

Of the 31 participants, all are under 30 years of age (19 – 24). The mean age is 21.12 years, with mode 20 years. 64.5% are females; 22.58% have a family income of over a hundred thousand US$ and 90.32% are Caucasian Americans.

Testing of Competing Hypotheses

Hypotheses for Search Mode

E-Commerce Vs. M-Commerce, E-Commerce Vs. In-Store, In-Store Vs. M-Commerce: Paired-sample t-tests of the dependent variables obtained from participants who undertook search tasks in all the three cells, i.e., e-commerce and m-commerce, in-store and e-commerce AND in-store and m-commerce modes are presented in Tables 51, 52 and 53 (See below). It can be seen that:

a) The total number of total pages searched for is significantly different:
   a. Between e-commerce and m-commerce (Tables 51 and 54), with more pages being searched in the e-commerce mode ($Mean_{E\text{-}Commerce}$=17.62, $Mean_{M\text{-}Commerce}$=13.69; p-value < .05).
   b. As well as between e-commerce and in-store (Tables 52 and 55), with more brands being searched in the e-commerce mode ($Mean_{E\text{-}Commerce}$=54.07, $Mean_{In\text{-}Store}$ =14.57; p-value < .05).

b) There is no significant difference between in-store and m-commerce (Tables 53 and 56). ($Mean_{In\text{-}Store}$=4.25, $Mean_{M\text{-}Commerce}$=4.00)

The above results provide further support for Hypothesis 1(a), with the amount of information searched following an inverted U-shaped curve (($Mean_{In\text{-}Store} < Mean_{E\text{-}Commerce} > Mean_{M\text{-}Commerce}$). However, no support is found for hypothesis 2(a) or 2(b). Instead, the time spent (($Mean_{In\text{-}Store}$ (13:36 min) > $Mean_{E\text{-}Commerce}$ (12.43 min) < $Mean_{M\text{-}Commerce}$(17.37 min)) on the three modes seem to be following a U-shaped curve. Both these results replicate the ones that are reported for experiment 1.

Table 51: Paired Samples Test: E-Commerce Vs. M-Commerce

		Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
			Lower	Upper			
Pair 1	TIME1ST - TIME1ST1	-0:00:54	-0:04:06	0:02:17	-.618	12	>.05
Pair 2	TIME2ND - TIME2ND1	-0:00:28	-0:02:20	0:01:23	-.547	12	>.05
Pair 3	TIMETOT - TOMETOT1	-0:01:37	-0:06:28	0:03:14	-.726	12	>.05
Pair 4	TIMEDEC - TIMEDEC1	-0:01:22	-0:05:53	0:03:08	-.664	12	>.05
Pair 5	BRAND1ST - BRAND1	1.69	-.68	4.06	1.555	12	>.05
Pair 6	OPT1ST - OPT1ST1	1.38	-8.60	11.36	.302	12	>.05
Pair 7	PAGES1ST - PAGES1	1.69	-.68	4.06	1.555	12	>.05
Pair 8	BRAND2ND - BRAND2	2.23	.57	3.89		12	<.05
Pair 9	OPT2ND - OPT2ND1	4.38	-4.49	13.26	1.076	12	>.05
Pair 10	PAGES2ND - PAGES2	2.23	.57	3.89	2.932	12	<.05
Pair 11	BRANDTOT - BRANDTO1	3.92	.17	7.68	2.277	12	<.05
Pair 12	OPTTOT - OPTTOT1	5.77	-11.25	22.79	.739	12	>.05
Pair 13	PAGESTOT - PAGESTO1	3.92	.17	7.68	2.277	12	<.05

Table 52: Paired Samples Test: E-Commerce Vs. In-Store

		Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
			Lower	Upper			
Pair 1	TIME1ST - TIME1ST1	-0:00:19	-0:03:09	0:02:30	-.250	13	>.05
Pair 2	TIME2ND - TIME2ND1	-0:00:50	-0:03:05	0:01:24	-.809	13	>.05
Pair 3	TIMETOT - TOMETOT1	0:00:52	-0:04:04	0:05:49	.384	13	>.05
Pair 4	TIMEDEC - TIMEDEC1	-0:21:46	-0:27:11	-0:16:22	-8.695	13	<.001
Pair 5	BRAND1ST - BRAND1	1.29	-1.01	3.58	1.212	13	>.05
Pair 6	OPT1ST - OPT1ST1	-10.57	-18.72	-2.43	-2.804	13	<.05
Pair 7	PAGES1ST - PAGES1	-21.29	-30.44	-12.13	-5.021	13	<.001
Pair 8	BRAND2ND - BRAND2	.57	-1.31	2.45	.658	13	>.05
Pair 9	OPT2ND - OPT2ND1	-9.07	-19.91	1.77	-1.808	13	<.05
Pair 10	PAGES2ND - PAGES2	-18.21	-26.19	-10.24	-4.936	13	
Pair 11	BRANDTOT - BRANDTO1	1.86	-1.97	5.69	1.048	13	>.05
Pair 12	OPTTOT - OPTTOT1	-19.64	-38.16	-1.13	-2.292	13	<.05
Pair 13	PAGESTOT - PAGESTO1	-39.50	-56.47	-22.53	-5.027	13	<.001

Table 53: Paired Samples Test: In-Store Vs. M-Commerce

		Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
			Lower	Upper			
Pair 1	TIME1ST - TIME1ST1	-0:03:48	-0:11:37	0:04:00	-1.551	3	>.05
Pair 2	TIME2ND - TIME2ND1	0:01:05	-0:03:29	0:05:41	.759	3	>.05
Pair 3	TIMETOT - TOMETOT1	-0:05:42	-0:13:17	0:01:52	-2.393	3	<.05
Pair 4	TIMEDEC - TIMEDEC1	0:15:54	0:08:02	0:23:45	6.445	3	<.05
Pair 5	BRAND1ST - BRAND1	.25	-5.17	5.67	.147	3	>.05
Pair 6	OPT1ST - OPT1ST1	9.75	-8.64	28.14	1.687	3	>.05
Pair 7	PAGES1ST - PAGES1	18.75	-12.31	49.81	1.921	3	>.05
Pair 8	BRAND2ND - BRAND2	3.00	-4.90	10.90	1.208	3	>.05
Pair 9	OPT2ND - OPT2ND1	21.00	-11.95	53.95	2.029	3	>.05
Pair 10	PAGES2ND - PAGES2	24.50	-9.09	58.09	2.321	3	>.05
Pair 11	BRANDTOT - BRANDTO1	3.25	-9.24	15.74	.828	3	>.05
Pair 12	OPTTOT - OPTTOT1	30.75	-19.05	80.55	1.965	3	>.05
Pair 13	PAGESTOT - PAGESTO1	43.25	-20.00	106.50	2.176	3	>.05

Table 54: ANOVA: E-Com Vs. M-Com

Source	df	F	Sig.	
Time 1st	1	.002	>.05	$F_{1,10}$
Time 1st * Task Type	2	2.515	>.05	$F_{2,10}$
Task Type	2	5.005	>.05	$F_{2,10}$
Time 2nd	1	.079	>.05	$F_{1,10}$
Time 2nd * Task Type	2	.301	>.05	$F_{2,10}$
Task Type	2	1.866	>.05	$F_{2,10}$
Time Total	1	.060	>.05	$F_{1,10}$
Time Total* Task Type	2	1.549	>.05	$F_{2,10}$
Task Type	2	4.581	<.05	$F_{2,10}$
Time Decision	1	.027	>.05	$F_{1,10}$
Time Decision* Task Type	2	1.714	>.05	$F_{2,10}$
Task Type		3.950	<.05	
Brands 1st	1	1.749	>.05	$F_{1,10}$
Brands 1st * Task Type	2	.014	>.05	$F_{2,10}$
Task Type	2	5.715	<.05	$F_{2,10}$
Options 1st	1	.136	>.05	$F_{1,10}$
Options 1st * Task Type	2	.187	>.05	$F_{2,10}$
Task Type	2	5.572	<.05	$F_{2,10}$
Pages 1st	1	1.749	>.05	$F_{1,10}$
Pages 1st * Task Type	2	.014	>.05	$F_{2,10}$
Task Type	2	5.715	<.05	$F_{2,10}$
Brands 2nd	1		<.05	$F_{1,10}$
Brands 1st * Task Type	2	.915	>.05	$F_{2,10}$
Task Type	2	2.310	>.05	$F_{2,10}$
Options 2nd	1	.503	>.05	$F_{1,10}$
Options 2nd * Task Type	2	.606	>.05	$F_{2,10}$
Task Type	2	2.300	>.05	$F_{2,10}$
Pages 2nd	1	5.944	<.05	$F_{1,10}$
Pages 2nd * Task Type	2	.915	>.05	$F_{2,10}$
Task Type	2	2.310	>.05	$F_{2,10}$
Brand Total	1	3.468	<.05	$F_{1,10}$
Brands Total * Task Type	2	.210	>.05	$F_{2,10}$
Task Type	2	4.762	<.05	$F_{2,10}$
Options Total	1	.319	>.05	$F_{1,10}$
Options Total * Task Type	2	.056	>.05	$F_{2,10}$
Task Type		3.963	<.05	$F_{2,10}$
Pages Total	1	3.468	<.05	$F_{1,10}$
Pages Total * Task Type	2	.210	>.05	$F_{2,10}$
Task Type	2	4.762	<.05	$F_{2,10}$

Table 55: ANOVA: E-Com Vs. In-Store

Source	df	F	Sig.	
Time 1st	1	.188	>.05	$F_{1,11}$
Time 1st * Task Type	2	.634	>.05	$F_{2,11}$
Task Type	2	4.298	<.05	$F_{2,11}$
Time 2nd	1	.985	>.05	$F_{1,11}$
Time 2nd * Task Type	2	.637	>.05	$F_{2,11}$
Task Type	2	5.7	<.05	$F_{2,11}$
Time Total	1	.027	>.05	$F_{1,11}$
Time Total* Task Type	2	.552	>.05	$F_{2,11}$
Task Type	2	5.075	<.05	$F_{2,11}$
Time Decision	1	72.340	<.05	$F_{1,11}$
Time Decision* Task Type	2	.864	>.05	$F_{2,11}$
Task Type	2	3.163	<.05	$F_{2,11}$
Brands 1st	1	1.021	>.05	$F_{1,11}$
Brands 1st * Task Type	2	.364	>.05	$F_{2,11}$
Task Type	2		<.05	$F_{2,11}$
Options 1st	1	8.943	<.05	$F_{1,11}$
Options 1st * Task Type	2	1.561	>.05	$F_{2,11}$
Task Type	2	8.071	<.05	$F_{2,11}$
Pages 1st	1	33.374	<.05	$F_{1,11}$
Pages 1st * Task Type	2	3.280	<.05	$F_{2,11}$
Task Type	2	10.412	<.05	$F_{2,11}$
Brands 2nd	1	.538	>.05	$F_{1,11}$
Brands 1st * Task Type	2	.373	>.05	$F_{2,11}$
Task Type	2	30.086	<.05	$F_{2,11}$
Options 2nd	1	3.430	<.05	$F_{1,11}$
Options 2nd * Task Type	2	.750	>.05	$F_{2,11}$
Task Type	2	5.990	<.05	$F_{2,11}$
Pages 2nd	1	28.587	<.05	$F_{1,11}$
Pages 2nd * Task Type	2	2.132	>.05	$F_{2,11}$
Task Type	2		<.05	$F_{2,11}$
Brand Total	1	.926	>.05	$F_{1,11}$
Brands Total * Task Type	2	.341	>.05	$F_{2,11}$
Task Type		25.752	<.05	$F_{2,11}$
Options Total	1	5.699	<.05	$F_{1,11}$
Options Total * Task Type	2	1.108	>.05	$F_{2,11}$
Task Type	2	7.868	<.05	$F_{2,11}$
Pages Total	1	31.694	<.05	$F_{1,11}$
Pages Total * Task Type	2	2.743	>.05	$F_{2,11}$
Task Type	2	9.381	<.05	$F_{2,11}$

Table 56: ANOVA: In-Store Vs. M-Com

Source	df	F	Sig.	
Time 1st	1	5.536	>.05	$F_{1,1}$
Time 1st * Task Type	2	2.141	>.05	$F_{2,1}$
Task Type	2	199.403	<.05	$F_{2,1}$
Time 2nd	1	1.586	>.05	$F_{1,1}$
Time 2nd * Task Type	2	1.412	>.05	$F_{2,1}$
Task Type	2	2.079	>.05	$F_{2,1}$
Time Total	1	3.463	>.05	$F_{1,1}$
Time Total* Task Type	2	.362	>.05	$F_{2,1}$
Task Type	2	4416.012	<.05	$F_{2,1}$
Time Decision	1	18.057	>.05	$F_{1,1}$
Time Decision* Task Type	2	.309	>.05	$F_{2,1}$
Task Type	2	2041.824	<.05	
Brands 1st	1	1.800	>.05	$F_{1,1}$
Brands 1st * Task Type	2	34.250	>.05	$F_{2,1}$
Task Type	2	122.250	<.05	$F_{2,1}$
Options 1st	1	11.084	>.05	$F_{1,1}$
Options 1st * Task Type	2	4.448	>.05	$F_{2,1}$
Task Type	2	41.015	>.05	$F_{2,1}$
Pages 1st	1	3537.800	<.05	F
Pages 1st * Task Type	2	1142.250		$F_{2,1}$
Task Type	2	1534.250	<.05	$F_{2,1}$
Brands 2nd	1	125.000	<.05	$F_{1,1}$
Brands 1st * Task Type	2	73.500	<.05	$F_{2,1}$
Task Type	2	40.500	>.05	$F_{2,1}$
Options 2nd	1	98.061	<.05	$F_{1,1}$
Options 2nd * Task Type	2	25.745	>.05	$F_{2,1}$
Task Type	2	29.480	>.05	$F_{2,1}$
Pages 2nd	1		<.05	F
Pages 2nd * Task Type	2	1336.500	<.05	$F_{2,1}$
Task Type	2	1181.500		$F_{2,1}$
Brand Total	1			$F_{1,1}$
Brands Total * Task Type	2			$F_{2,1}$
Task Type	2	75.188	<.05	$F_{2,1}$
Options Total	1	38.503	>.05	$F_{1,1}$
Options Total * Task Type	2	10.979	>.05	$F_{2,1}$
Task Type	2	35.315	>.05	$F_{2,1}$
Pages Total	1			$F_{1,1}$
Pages Total * Task Type	2			$F_{2,1}$
Task Type	2	1320.187	<.05	$F_{2,1}$

Participants assigned to the *E-Commerce Vs. M-Commerce* cell indicate that while making the final choice (in the two modes), when using m-commerce they rely more on the information presented to them the second time, than when they are in the e-commerce mode ($Mean_{E\text{-}Commerce}$ (5.23[26]) < $Mean_{M\text{-}Commerce}$ (6.46)[27]) ($t_{12,.05}$=-2.125, p-value < 0.05). Therefore, participants in the m-commerce mode, disagree to a greater extent (than those in the e-commerce mode), on relying on the second set of information presented to them. The results mean that in the M-commerce mode, participants depend more on their memory than on stimulus for making their second choice. Also, when making the second choice in the *E-Commerce Vs. In-Store environment*, more brands are processed in the in-store environment than in the e-commerce environment ($Mean_{E\text{-}Commerce}$ (5.77[28]) > $Mean_{In\text{-}Store}$ (5.62)[29]). M-Commerce is the least "rich" mode used in the experiment, and here, more than in any of the other modes, there is the greatest relying on memory than on stimulus. In other words, there is a greater memory-driven processing in the m-commerce mode and a greater stimulus-driven processing in the in-store environment. This again lends support to hypothesis 3(a), as in experiment 1.

Hypotheses for Task Type

E-Commerce Vs. M-Commerce, E-Commerce Vs. In-Store, In-Store Vs. M-Commerce: As can be seen in the Tables 54, 55 and 56, "level of complexity" is significantly different across the different levels. From the paired-sample t-tests of the dependent variables, as mentioned above, it can be seen that for the between factor, *task type* (simple → complex), there is significant difference between the three levels of complexity in each pair of modes ($Mean_{Complex}$ >

[26] All reported values are each the mean on a scale of 1 to 7; 1=strongly agree and 7=strongly disagree
[27] All reported values are each the mean on a scale of 1 to 7; 1=strongly agree and 7=strongly disagree
[28] All reported values are each the mean on a scale of 1 to 7; 1=strongly agree and 7=strongly disagree
[29] All reported values are each the mean on a scale of 1 to 7; 1=strongly agree and 7=strongly disagree

$Mean_{Simple}$). Examining from the perspective of the *amount of information* searched, it is observed that:

a. In the e-commerce Vs. m-commerce manipulation (Tables 51 and 54) *task type* has a significant effect on most of the dependent variables. There is an increase in the number of brands processed as the level of complexity increases. For example,
    i. The number of brands searched in the *e-commerce mode* are ($Mean_{Simple=4.0} < Mean_{Not\text{-}So\text{-}Simle=10.0} < Mean_{Complex=10.33}$) (p-value < .05)
    ii. The number of brands searched in the *m-commerce mode* are ($Mean_{Simple=2.67} < Mean_{Not\text{-}So\text{-}Simle=8.25} < Mean_{Complex=8.5}$) (p-value < .05)

The results mentioned are similarly observed for some of the other dependent variables like number of options searched and number of pages searched. Therefore, these results for factor *task type* (as in experiment 1) lend support to categorization theory: there is an increasing trend from *simple* to *complex*. Note, however, that for factor *mode of search* the number of brands searched for is higher in e-commerce than in m-commerce ($Mean_{E\text{-}Commerce} > Mean_{M\text{-}Commerce}$) (p-value < .05), again lending support to cost theory.

b. In the e-commerce Vs. in-store manipulation (Tables 52 and 55), *task type* is significant for all the dependent variables. For example:
    i. The number of brands searched in the *e-commerce mode* are ($Mean_{Simple=2.40} < Mean_{Not\text{-}So\text{-}Simle=10.17} > Mean_{Complex=7.67}$) (p-value < .05)

ii. The number of brands searched in the *in-store environment* are

($Mean_{Simple=2.2} < Mean_{Not\text{-}So\text{-}Simle=7.83} > Mean_{Complex=6.67}$) (p-value < .05)

The results mentioned are similarly observed for some of the other dependent variables like number of options searched and number of pages searched. Hence, <u>for factor *task type*</u>, unlike in experiment 1, the amount of information searched seems to follow the predictions made by cost theory: <u>an inverted U-shaped curve</u> is found. However, for factor *mode of search* ($Mean_{E\text{-}Commerce} > Mean_{In\text{-}Store}$) (p-value < .05), again support is found for cost theory.

c. In the e-commerce Vs. in-store manipulation (Tables 53 and 56), *task type* is significant for most of the dependent variables. For example:

i. The number of brands searched in the *in-store environment* are

($Mean_{Simple=1.5} < Mean_{Not\text{-}So\text{-}Simle=3.0} < Mean_{Complex=11.0}$) (p-value < .05)

ii. The number of brands searched in the *m-commerce mode* are

($Mean_{Simple=2.0} < Mean_{Not\text{-}So\text{-}Simle=6.0} \sim Mean_{Complex=6.0}$) (p-value < .05)

The results mentioned are similarly observed for some of the other dependent variables like number of options searched and number of pages searched. Here, like in experiment 1, <u>for factor *task type*</u>, the amount of information searched seems to follow the predictions made by categorization theory: <u>an increasing trend is observed</u>. However, for the factor *mode of search* ($Mean_{E\text{-}Commerce} > Mean_{In\text{-}Store}$) (p-value < .05), support for cost theory is found.

Overall, for factor *task type*, information search increases from *simple* to *complex*, therefore lending support to hypothesis 5(b). In other words, the amount of search undertaken for *task type*, follows the predictions made by categorization theory ($Mean^{30}_{Simple} < Mean_{Not\text{-}So\text{-}Simle} < Mean_{Complex}$). Examining *time spent* for factor *task type*, the following are observed:

[30] Here, "Mean" is the *amount of information* searched

a) In the e-commerce Vs. m-commerce manipulation,
    a. Within the *e-commerce mode*, time spent follows an inverted u-shaped curve ($Mean_{Simple=10.03}$[31] < $Mean_{Not\text{-}So\text{-}Simle=20.29}$ > $Mean_{Complex=11.46}$) (p-value < .05)
    b. Within the *m-commerce mode*, time spent also follows an inverted u-shaped curve ($Mean_{Simple=6.09}$ < $Mean_{Not\text{-}So\text{-}Simle=20.29}$ > $Mean_{Complex=11.46}$) (p-value < .05)
b) In the e-commerce Vs. in-store manipulation,
    a. Within the *e-commerce mode*, time spent follows an inverted u-shaped curve ($Mean_{Simple=8.49}$ < $Mean_{Not\text{-}So\text{-}Simle=14.17}$ > $Mean_{Complex=10.41}$) (p-value < .05)
    b. Within the *in-store environment*, time spent also follows an inverted u-shaped curve ($Mean_{Simple=26.55}$ < $Mean_{Not\text{-}So\text{-}Simle=36.28}$ > $Mean_{Complex=37.49}$) (p-value < .05)
c) In the in-store Vs. m-commerce manipulation,
    a. Within the *in-store environment*, time spent follows a u-shaped curve ($Mean_{Simple=28.0}$ > $Mean_{Not\text{-}So\text{-}Simle=19.53}$ < $Mean_{Complex=34.24}$) (p-value < .05)
    b. Within the *m-commerce mode*, time spent also follows a u-shaped curve ($Mean_{Simple=9.32}$ > $Mean_{Not\text{-}So\text{-}Simle=7.26}$ < $Mean_{Complex=20.11}$) (p-value < .05)

Therefore, for the factor *task type*, the time spent follows an inverted u-shaped curve in most of the manipulations ($Mean^{32}_{Simple}$ < $Mean_{Not\text{-}So\text{-}Simle}$ > $Mean_{Complex}$). This provides support for hypothesis 6(a). The two hypotheses, 5(b) and 6(a) supported, replicate the results of experiment 1.

[31] Time spent is reported in minutes
[32] Here, "Mean" is *time spent* on undertaking the search

Hypotheses for Task Type – Mode of Search Fit

E-Commerce Vs. M-Commerce, E-Commerce Vs. In-Store, In-Store Vs. M-Commerce:

In the *E-Commerce Vs. M-Commerce* cell, a significant difference exists between the perceived fit in the two modes ($F_{1,10}$=13.66, p-value < .05), with a greater perceived fit with the e-commerce mode (Mean[33]$_{E\text{-}Commerce}$=2.54) than in the m-commerce mode ($Mean_{M\text{-}Commerce}$=5.69) (Figure 21(a)). Perceived enjoyment is not significantly different. The following is also observed:

a) Satisfaction with e-commerce ($Mean_{E\text{-}Commerce}$=2.62) is greater ($F_{1,10}$=12.634, p-value < .005) than that with m-commerce ($Mean_{M\text{-}Commerce}$=5.77). (Figure 21(b))

b) A greater ($F_{1,10}$=5.260, p-value < .05) search effort is expended in the m-commerce ($Mean_{M\text{-}Commerce}$=3.85) mode, than in the e-commerce mode ($Mean_{E\text{-}Commerce}$=3.08). (Figure 21(c))

c) When the question of repeat use of the mode is asked, for the e-commerce mode participants indicate that they were more ($F_{1,10}$=31.296, p-value < .001) likely to use the e-commerce mode ($Mean_{E\text{-}Commerce}$=2.54) again than those in the m-commerce mode ($Mean_{M\text{-}Commerce}$=5.54). (Figure 21(d))

Therefore, overall in the *E-Commerce Vs. M-Commerce* cell, there is a greater perceived fit (of the task type to the mode of search) in *e-commerce* than in *m-commerce*. Support is found for hypotheses 4, 8, 9 and 10. Hypothesis 7 is not supported. Covariate analysis for experiment 2 is not carried out due to the small number of participants in the experiment.

[33] All reported values are each the mean on a scale of 1 to 7; 1=strongly agree and 7=strongly disagree

Figure 21(a): Perceived Fit

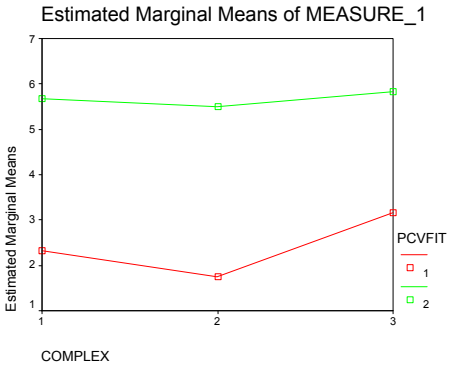


Figure 21(b): Satisfaction

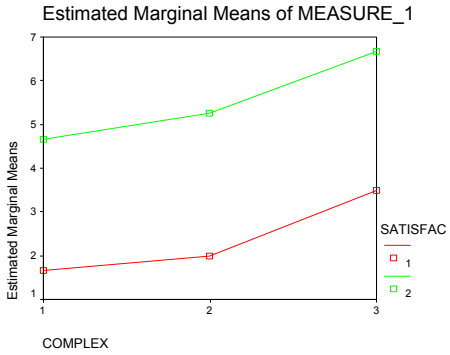


Figure 21(c): Search Effort

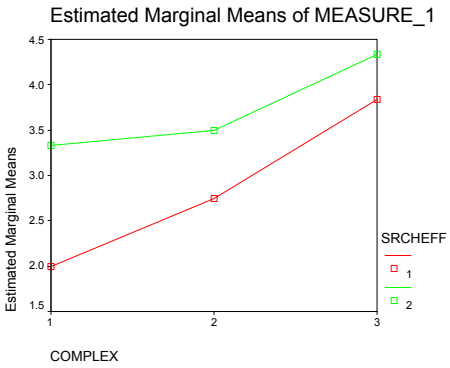


Figure 21(d): Loyalty

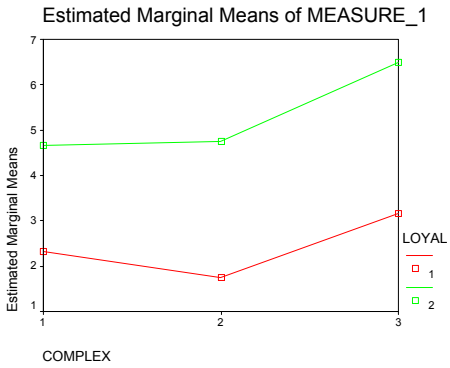


Figure 21: Task-Mode Fit: E-Commerce Vs. M-Commerce

1 = E-Commerce Mode; 2 = M-Commerce Mode

In the *E-Commerce Vs. In-Store* cell, a significant difference exists between the perceived fit in the two modes ($F_{1,11}$=18.702, p-value < .001), with a greater perceived fit with the e-commerce mode (Mean[34]$_{E\text{-}Commerce}$=2.79) than in the in-store environment ($Mean_{In\text{-}Store}$=4.71) (Figure 22(a)). Loyalty is not significantly different. The following is also observed:

a) Perceived enjoyment is higher ($F_{1,11}$=9.735, p-value < .01) in the e-commerce mode ($Mean_{E\text{-}Commerce}$=3.00) than in the in-store environment ($Mean_{In\text{-}Store}$=4.21). (Figure 22(b))
b) Satisfaction with e-commerce ($Mean_{E\text{-}Commerce}$=1.86) is greater ($F_{1,11}$=12.887, p-value .004) than that with in-store ($Mean_{In\text{-}Store}$=3.36). (Figure 22(c))
c) A greater ($F_{1,11}$=4.019, p-value < .05) search effort is expended in the e-commerce ($Mean_{E\text{-}Commerce}$=4.00) mode, than in the in-store environment ($Mean_{In\text{-}Store}$=3.09). (Figure 22(d))

Therefore, overall in the *E-Commerce Vs. In-Store* cell, there is a greater perceived fit (of the task type to the mode of search) in e-commerce than in the in-store environment. Support is found for hypotheses 4, 7, 8 and 9.

In the *In-Store Vs. M-Commerce* cell, only loyalty is found to be significant. Perceived fit, perceived enjoyment, satisfaction and search effort are not significant. However, loyalty is significantly different in the different modes ($F_{1,1}$=72.200, p-value < .05), with loyalty being greater in the in-store environment (Mean[35]$_{In\text{-}Store}$=3.00) than in the m-commerce mode ($Mean_{M\text{-}Commerce}$=5.75). (Figure 23). Therefore, overall in the *In-Store Vs. M-Commerce* cell, partial support is found for hypothesis 10. The reason why support for hypotheses 4, 7, 8 and 9 could not found is the small sample size in this cell.

[34] All reported values are each the mean on a scale of 1 to 7; 1=strongly agree and 7=strongly disagree
[35] All reported values are each the mean on a scale of 1 to 7; 1=strongly agree and 7=strongly disagree

Figure 22(a): Perceived Fit

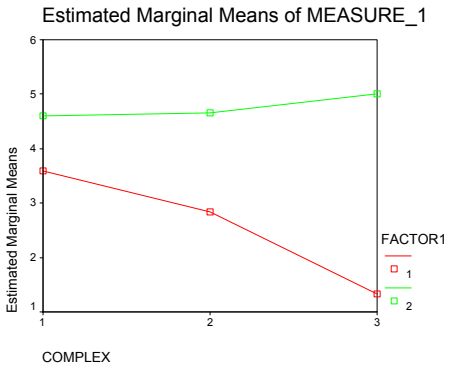


Figure 22(b): Perceived Enjoyment

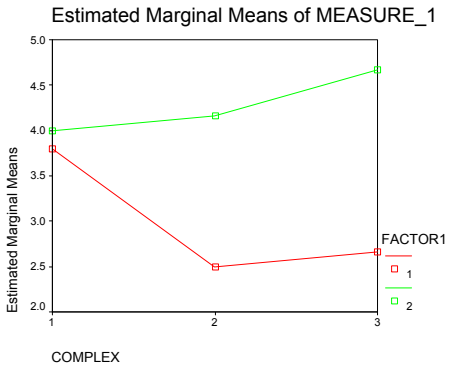


Figure 22(c): Satisfaction

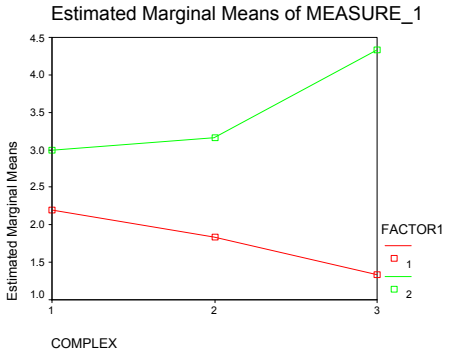


Figure 22(d): Search Effort

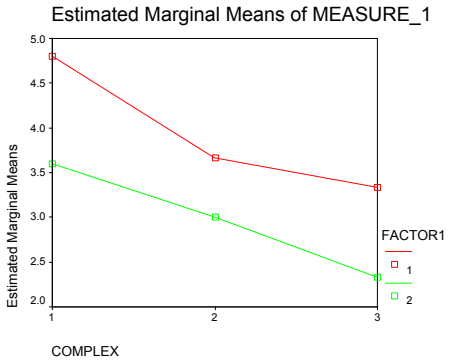


Figure 22: Task-Mode Fit: E-Commerce Vs. In-Store

1 = E-Commerce Mode; 2 = In-Store Environment

Loyalty

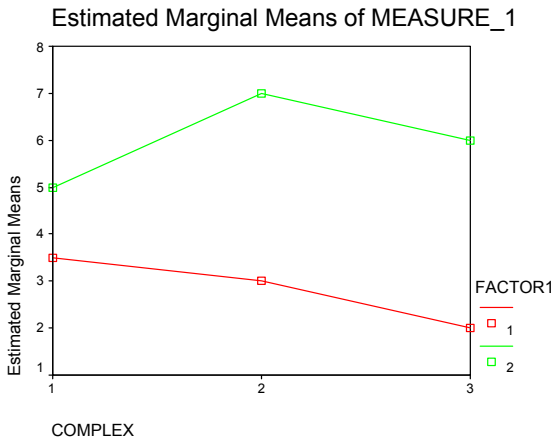


Figure 23: Task-Mode Fit: In-Store Vs. M-Commerce

1 = In-Store Environment; 2 = M-Commerce Mode

As is evident from the two experiments discussed, H1(a), H3(a), H5(b), H6(a), H4, H7, H8, H9 and H10 are supported in the two experiments reported in this section. H12, H13, H16 and H18 are supported in experiment 1. Hypotheses 11, 14, 15, 17 and 19 are not supported.

A third study is conducted, where participants are not provided with any explicit instruction about the *mode* in which to conduct the search task. They are presented with a task (e.g., choose an airlines ticket OR choose a restaurant) and are then asked to choose the search mode (in-store, e-commerce, m-commerce) in which they would want to conduct the information search for making a choice. This study is primarily conducted to explore if participants have a preference for any specific mode of search.

The greater risk reflected in decision tasks with higher levels of difficulty influences the types of information sources that consumers seek (Locander and Hermann 1979). Hence, we hypothesize that participants will choose to undertake certain search tasks usually on certain modes, i.e., task-media fit is perceived by consumers (Hypothesis 4; Table 37).

37 participants signed up for the study. The participants are recruited in the same manner, and are similar to participants in experiments 1 and 2. All those who signed up, completed the study. 31 of the 37 participants chose to conduct the search task in the e-commerce mode, 5 chose the in-store mode and 1 chose the m-commerce mode. Most participants chose the e-commerce mode for carrying out the choice tasks. All the participants who chose the in-store environment for conducting the search task, were given the restaurant task. This also supports the findings in the two experiments – that consumers perceive certain tasks as being more suitable for certain specific modes.

DISCUSSION

Findings

The overall results of hypothesis testing are summarized in Tables 57, 58, 59 and 60. The findings from the two experiments give similar results. It seems that the amount of information searched in the different modes, follows the predictions made by cost theory. Lesser amount of search is undertaken in the most rich medium (i.e., in-store), and the amount information searched increases as one moves on to e-commerce. However, it is the least in m-commerce (i.e., least rich medium). Therefore, an inverted U-shaped curve is established. Interestingly enough, the amount of time spent in the three modes of search is also significantly different, but it follows a U-shaped curve, with the least amount of time spent in the e-commerce mode.

Further, information processing increasingly becomes memory-driven as consumers use leaner media. In other words, consumers using the m-commerce mode will tend to undertake more memory-driven information processing, than consumers using the in-store environment, where they will undertake more stimulus-driven information processing. When task type (i.e., complexity) is explored, however, the amount of information searched follows the path suggested by categorization theory, and an increasing slope is observed, as one moves from simple → complex.

Mode – Task Type "fit" is perceived by consumers. Over-fit, ideal fit and under-fit for the search tasks are discerned. Consumers prefer carrying out the search task (i.e., choose an airlines ticket) in the e-commerce mode, and the experience task (i.e., choose a restaurant) in the in-store environment. M-commerce is not particularly favored for any of the tasks (used in the two experiments). Further, it is indicated by consumers that the m-commerce mode is more suitable for simple tasks. Therefore, it is possible that the tasks included in the experiments are

Table 57: Results for Pairs of Competing Hypotheses for Mode of Search

Number	Hypotheses	Theory	Findings
H1(a)	As the media richness of the mode decreases, the costs of search increase. As a result the total information search undertaken follows an inverted U-shaped curve.	Cost Theory	**Supported** Experiments 1 and 2
H2(a)	As the media richness of the mode decreases, the costs of search increase. As a result the time spent on total information search follows an inverted U-shaped curve.	Cost Theory	Not Supported
H3(a)	As the media richness of the mode decreases, the costs of search increase. As a result, consideration sets and decision making are progressively **less** stimulus-driven and **more** memory-driven.	Cost Theory	**Supported** Experiments 1 and 2

Table 58: Results for Pairs of Competing Hypotheses for Task Type

No.	Hypotheses	Theory	Findings
H5(b)	As the perceived risk of a search task increases, the amount of information searched increases. (+)	Categorization Theory	**Supported** Experiments 1 and 2
H6(a)	As the perceived cost (reflected by the level of complexity) of a search task increases, the time spent on undertaking information search follows an inverted U-shaped curve. (Inverted-U).	Cost Theory	**Supported** Experiments 1 and 2
H6(b)	As the perceived risk of a search task increases, the time spent on undertaking information search increases. (+)	Categorization Theory	Not Supported

Table 59: Results for Hypotheses for Task-Mode of Search Fit

	No.	Hypotheses	Theory	Findings
Fit	H4	Task-media of search fit is perceived by consumers.	MRT[36] TMF[37]	**Supported** Experiments 1 and 2
Enjoyment	H7(a)	An ideal-fit between search task and mode of search will lead to higher individual enjoyment than over-fit	MRT	**Supported** Experiments 1 and 2
	H7(b)	An ideal-fit between search task and mode of search will lead to higher individual enjoyment than under-fit	MRT	
	H7(c)	An over-fit between search task and mode of search will lead to higher individual enjoyment than under-fit	MRT	
Satisfaction	H8(a)	An ideal-fit between search task and mode of search will lead to higher individual satisfaction than over-fit	MRT	**Supported** Experiments 1 and 2
	H8(b)	An ideal-fit between search task and mode of search will lead to higher individual satisfaction than under-fit	MRT	
	H8(c)	An over-fit between search task and mode of search will lead to higher individual satisfaction than under-fit	MRT	
Perceived Effort	H9(a)	An ideal-fit between search task and mode of search will lead to lower individual perceived effort than over-fit	MRT	**Supported** Experiments 1 and 2
	H9(b)	An ideal-fit between search task and mode of search will lead to lower individual perceived effort than under-fit	MRT	
	H9(c)	An over-fit between search task and mode of search will lead to lower individual perceived effort than under-fit	MRT	
Loyalty	H10(a)	An ideal-fit between search task and mode of search will lead to higher loyalty than over-fit	MRT	**Supported** Experiments 1 and 2

[36] Media Richness Theory
[37] Task-Media Fit

H10(b)	An ideal-fit between search task and mode of search will lead to higher loyalty than under-fit	MRT
H10(c)	An over-fit between search task and mode of search will lead to higher loyalty than under-fit	MRT

Table 60: Results for Hypotheses for Covariates and Interaction between Modes of Search and Task Type

No.	Hypotheses	Theory	Findings
H11	The greater the perceived risk an individual has, the more will be the amount of information search undertaken (+)	Categorization Theory	Not Supported
H12	The greater the perceived cost an individual has, the amount of information search undertaken will follow an inverted U-shaped curve	Cost Theory	**Supported** Experiment 1
H13	The greater the prior experience an individual has, the less will be the amount of information search undertaken (-)		**Supported** Experiment 1
H14	The higher the tolerance of ambiguity in an individual, the more will be the amount of information search undertaken (+)		Not Supported
H15	Middle levels of income will lead to more amount of information search undertaken		Not Supported
H16	The higher the need for cognitive clarity, the more will be the amount of information search undertaken (+)		**Supported** Experiment 1
H17	The higher the information seeking self efficacy, the lower will be the amount of information search undertaken (-)		Not Supported
H18	The higher the price sensitivity, the greater will be the amount of information search undertaken (+)		**Supported** Experiment 1
H19(a)	According to cost theory, there is significant interaction effect between the mode of search chosen and the task type for amount of search.	Cost Theory	Not Supported
H19(b)	According to categorization theory, there is an interaction effect between the mode of search chosen and the task type for amount of search.	Categorization Theory	Not Supported

not simple-enough for participants to feel comfortable carrying out in the m-commerce mode. If more simple tasks had been included, a clearer preference might have emerged.

Theoretical Implications

The set of (two) experiments that are undertaken in this second part of the study, are primarily focused on comparing information search behavior of consumers in the three modes that are explored in the experiments. Cost theory and Categorization theory make competing hypotheses – cost theory predicts an inverted U-shaped curve, while categorization theory predicts an upward rising curve (as one moves on from a more rich medium to a less rich medium). This has implications for the marketing academic.

As the results of the experiments show, the amount of information searched in the three modes follows the predictions made by cost theory, i.e., it follows an inverted U-shaped curve. This means that the amount of information searched for is low in the in-store the m-commerce environments, while it is high in the e-commerce environment. An additional interesting finding is that participants in the m-commerce mode (i.e., the least rich media) search for the least amount of information. In other words, when the cost of search is the greatest, the amount of information searched is the least. Further, there is a strong indication that for participants in the m-commerce mode, memory processing is stronger than stimulus processing, which means that participants probably prefer to reduce their cognitive processing costs and therefore avoid processing further information in modes where search costs are the highest. Applying similar explanation, it is clear why in a richer medium (i.e., in-store), stimulus processing is greater than memory processing. Therefore, all these findings are in line with the predictions made by cost theory.

The time required for carrying out the tasks across the three modes follows a U-shaped curve. This means that the time required in the in-store and the m-commerce environments are higher than that required in the e-commerce environment. A possible explanation for this might be that the in-store environment being the richest, though low in cognitive costs, causes "distraction" (Suh 1999, pp. 296) which accounts for more time being spent in this mode of search. In contrast, the m-commerce mode probably increases the cognitive costs of processing information, and this accounts for almost the same amount of time being spent on this mode, as in the in-store environment. Compared to these two modes, a participant spends the least time in the e-commerce environment, which could be because of the lower cognitive costs (as compared to the m-commerce mode) and limited "distractions" (as compared to the in-store environment).

In contrast, the amount of information searched in terms of task type follows a gradually rising curve. There can be two possible explanations for this observed result. The first explanation is that categorization theory holds. In other words, the greater the perceived risk associated with the complexity of the task, the more is the amount of information searched as a means of reducing that risk. The other explanation might be that what is observed is really *only* the rising part of the "inverted U-shaped curve" – i.e., a fuller range of complexity of *task type* could not be captured in the experiments. The second scenario, however, seems unlikely. As Malhotra (1982) shows, information overload does occur when 10 to 25 alternatives are processed by participants. The maximum amount of information processed by participants in this study is 100 options. Therefore, we suggest that for the factor *task type*, categorization theory holds.

The time required, in terms of complexity of the tasks, follows an inverted U-shaped curve, which lends support to cost theory. In other words, the time spent on a task initially

increases up to the point where search benefits outweigh search costs, and then decreases as cognitive costs increase. Therefore, overall, the context of information search seems to be better explained by cost theory as compared to categorization theory.

This study is probably the first instance of an attempt to bring information search behavior and media richness theory together. Information search behavior is explored in the context of different media. Overall, media richness theory is also supported. In all the experiments, there is a higher preference for the e-commerce mode for carrying out the tasks, followed by the in-store environment and the m-commerce environment, in that order. However, when the two services (i.e., airlines tickets and choosing a restaurant) are included in the analysis, there is a higher preference for carrying out the "experience" task (i.e., choosing a restaurant) in the in-store environment. The "search" task (i.e., choosing an airlines ticket) is thought to be more suited to be carried out in the e-commerce environment. None of these tasks are found to be suitable for the m-commerce mode. A possible explanation for this might be that a more simple task (than those that are included in the study), might have been more suited for the m-commerce environment.

Managerial Implications

One important finding is that users do not perceive the e-commerce mode and the m-commerce mode to be exact substitutes for one another. Rather, we find that users have specific behavioral characteristics in each of the three modes. Also, there are certain products/services that consumers prefer searching on the Internet (e.g., "search" type). Others are more comfortable to search for in an in-store environment (e.g., "experience" type).

The above information is invaluable for managers, as this is immensely helpful in determining retail, product and advertising strategies for each of the modes. For example, it is

probably unlikely for consumers to search for and choose items over the Internet that require a relatively higher cognitive processing. As the "complexity" attached to the decision-making increases, traditional media will be preferred over the Internet and m-commerce. "Complexity" is an aggregate of a number of different factors (product/service type, number of options, user characteristics, etc.) which managers have to tailor for each mode. Similar implications would be there for designing of content of advertising/communication materials in these modes.

Our findings suggest that m-commerce is be best-suited for very simple tasks. A marketer interested in sending advertising materials over a PDA would probably have to limit the amount of information to be sent. Information disseminated via mobile devices have to be relatively simple. Also, consumers find "scrolling" (when using a PDA) extremely "stressful". *Memory processing*, rather than *stimulus processing*, is stronger in the m-commerce mode. Hence, processing of subsequent messages get progressively difficult to the extent that consumers might decide not to pay any attention to them at all. Thus, managers have to make sure that they are able to make an impression or capture users' attention at one shot. Trying to get the information out to users will progressively get difficult the second time onwards.

Limitations

In the three experiments, undergraduate students were used to collect the data. Students are, nonetheless, consumers of certain products and services. The services that are used in the experiments are chosen with care, such that these might be services that are used by students as well as "real-world" consumers. Particular care has been taken to ensure that students serve as good surrogates for actual consumers. However, the possibility of threat to external validity remains.

Attempt is made to include different kinds of services as tasks for the participants in the experiments. “Search” and “experience” services are included, but “credence” service is not included in the task setup. The inclusion might have thrown additional light on search behavior in the three modes. From the framework for modes of search (Tables 2 and 3) that has been suggested, only three of the eight modes have been tested in the study. The other five modes can be tested in another study.

Since three modes are explored in the experiments, including a third kind of task might have explored the full scope of media richness theory. The two tasks (instead of three), explored media richness theory in a limited manner.

Future Directions

Some future directions for research can be found in the two different models that have been suggested. The baseline model (Figure 2) is testified through the meta-analysis. The competing model (Figure 3) that is based on e-commerce theory and practice, might be tested. Figure 3 has antecedent variables that have not been tested, and can be tested through a meta-analysis in the future, when a critical mass of meta-analysis that would have accumulated. It can also be tested through different studies, each testing a different set of variable(s) at a time.

Several research opportunities open up from the significant findings presented earlier. Researchers might be interested in exploring the other modes of search that are mentioned in our proposed framework that are not investigated in this study. Researchers might further be interested in exploring how different categories of products and (or) services affect information search behavior in the three different search modes (and other search modes).

Mobile commerce is a relatively new area of exploration in the field of marketing. Consumer responses to usages that are specific to the m-commerce environment (e.g., accessing

the Internet to check e-mails, receive news headlines, etc.) might be explored. More over, new tasks (e.g., products, other services, simpler tasks) can be used to further test the hypotheses that are explored here.

Moreover, even though it is clear that different media prompt different search behavior, it is not very clear whether "media richness" or "usability features" (of the media) contribute towards such behavior. Teasing out the effects of usability features and media richness of the m-commerce media would be of interest to both academic researchers and practitioners. Do the idea of "media richness" and "usability" overlap? Can the differences be teased out? Of the differences observed in the study here, how much can/should be attributed to "media richness" and how much can/should be attributed to attributed to "usability"?

SUMMARY OF UPCOMING CHAPTER

The next chapter serves as the final one. It provides a synthesis of the two parts that are presented in Chapters 2 and 3.

CHAPTER 4

CONCLUSION

This study is a two-part exploration of consumer information search behavior. The main dependent variable of interest in both parts of the study is the "amount of information search undertaken". We realize that a single study is not sufficient in exploring this vast topic. Hence two different methodologies are employed in the two parts, which help us to summarize and investigate this area to a greater extent.

In the first part, a meta-analysis is undertaken to summarize findings from extant literature. Studies (with "amount of information search" as the dependent variable) on traditional information search are synthesized to determine the effect size (distribution and central tendencies) and significance for each antecedent variable of information search. Some of the independent variables (e.g., number of alternatives, involvement, benefits of search) show relatively large effect sizes in explaining the independent variable. However, there are other variables (e.g., employment, self esteem, responsibility) that do not display meaningful effect sizes. Some of the significant moderators of information search are *age*, *gender*, *product type* and *income*.

Two separate models (Model 1 and Model 2) are proposed. The dependent variable is the "amount of information search undertaken" – in Model 1, it is the amount of information searched in the traditional channels, while in Model 2, it is the amount of search in the online environment. Model 1 is based on the meta-analysis, and is focused on listing the antecedent variables for traditional information search. Model 2 is based on our learning from e-commerce

theory and practice, and tries to provide a list of antecedent variables trying to explain online information search. New variables, pertinent to the Internet (e.g., 24-hour access, navigability, positive attitude towards technology) are incorporated in Model 2. A theoretical approach to information search on the Internet is much needed in this field of study. These models while trying to provide a holistic view of information search, also identifies several avenues for future research. These models can be empirically tested in full, OR only parts of these can be tested.

Trying to further understand the differences in modes of search, in part two of the study, two experiments are conducted, which test the effects of *modes of search* and *task type* on information search behavior. Experiment 1 is a between subjects design (sample size 162), while experiment two is a smaller experiment with a mixed subjects design[38] (sample size 31 – 31 of those who participated in study 1, completed study 2). The overall findings of the experiments suggest that the mode of search does have an impact on the amount of information search undertaken and the amount of time spent. Task-Type is also significant.

For factor *modes of search*, the outcome of the experiments suggest that the paths followed by the amount of information searched, follows the predictions made by cost theory, i.e., an inverted U-shaped curve is obtained. In other words, as one moves from a "rich" medium to a "lean" medium, the amount of information searched is initially low (in the "rich" medium), then increases with decreasing richness of the medium, and finally decreases as the "richness" if the medium further decreases. Also, there is a higher memory processing that is observed in the less "rich" modes (e.g., m-commerce, e-commerce) than in the richest mode of search (e.g., in-store). However, for factor task type, the amount of information searched follows the predictions made by categorization theory, i.e., an increasing curve is obtained. In other words, the amount of information searched increases with an increase in the level of complexity of the tasks.

[38] *Task type* is a within subjects factor.

Moreover, task-mode fit is perceived by participants. In other words, certain tasks are found to be more suitable for certain modes of search over the others. Participants examine the least number of brands in the m-commerce mode, even when they spend the most time in this mode. Also, e-commerce is the preferred mode for a search task (e.g., searching for an airlines ticket), while in-store is preferred for an experience task (e.g., searching for a restaurant).

DISCUSSION

Despite the academic and managerial importance and continued interest in information search, there has not yet been a comprehensive attempt to assess the general findings across studies in this area. The meta-analysis presented here is probably the first attempt to systematically summarize empirical findings on information search. Such an attempt might be useful for two reasons. First, research on information search correlates has been conducted in a number of contexts, yet no attempt has been made to assess the robustness of effects across conditions. Such an assessment can be useful in understanding the general strength (effect size) and variability of the relationships and the study conditions that moderate those relationships. Our study concludes that differences in study characteristics (e.g., product type and income) contribute to the variances in information search found across studies. Second, authors have reported widely varying strengths with respect to the direct effect of some variables on information search. For example, there has been an ongoing debate regarding whether the antecedent variable “knowledge” has a positive or a negative relationship with information search. In our meta-analysis we find that this relationship is overall *positive* (and highly significant) in nature. Therefore, an attempt has been made to provide systematic solutions has important questions.

The findings of our experiments have theoretical implications for the academic researcher and strategic implications for the marketing practitioner. Managers can take cue from the findings here when devising product and advertising strategies, as well as the contents of communication/advertising for the three different modes.

The Internet shopping market has become known as a revolution that is expanding 3-5 times faster than brick and mortar (Rosennberg 1980). Brannback (1997) suggests that consumers will no longer physically purchase products but rather use the Internet as a tool to gather information about the product, order it and have it delivered. Yet another opinion comes from Thruow (2001), who states, "What my generation finds strange and uncomfortable (e.g. buying a car on the Internet without a test ride) will seem completely normal to our grand children." Lau, Yau (1985) suggests, "out-shopping behavior is product specific and is influenced by the products price and form." Our findings tend to support the claim that search (shopping) behavior is influence by the type of the product.

One aspect becomes apparent as task-mode fit is explored: the new media (e.g., e-commerce, m-commerce) are other modes (media) in the wide variety of media that consumers use to search for information and shop for products and services. Researchers and managers need to gain an understanding of how consumers respond to these media. However, it would probably be best if the "newer" media are compared and contrasted to the traditional ones. Systematic exploration in this manner would make our learning richer and more meaningful.

REFERENCES

Ackerman, K. (1998), "Electronic Retailing: A Threat to Brick and Mortar?", *Business Credit*, 100 (6), pp. 8 – 11

Alba, Joseph W. and Howard Marmorstein (1987), "The Effects of Frequency Knowledge On Consumer Decision Making," *Journal of Consumer Research*, 14, 14-25

Alba, Joseph W. and J. Wesley Hutchinson (1987), "Dimensions of Consumer Expertise", *Journal of Consumer Research*, 13 (March), 411-454

Alba, Joseph, John Lynch, Barton Weitz, Chris Janiszewski, Richard Lutz, Alan Sawyer, and Stacy Wood (1997), "Interactive Home Shopping: Consumer, Retailer, and Manufacturer Incentives to Participate in Electronic Marketplaces", *Journal of Marketing*, 61 (July), 38-53

Anderson, John (1990), *Cognitive Psychology and Its Implications*, W. H. Freeman and Co., NY

Baecker, R. M., J. Grudin, W. A. S. Buxton, and S. Greenberg (1995), *Readings in human-computer interaction: Toward the year 2000*, San Francisco: Morgan Kauffman

Bakos, J. Yannis (1997), "Reducing Buyer Search Costs: Implications for Electronic Marketplaces", *Management Science*, 43 (December), 1676-1692

Bass, B. M., M. W. Pryer, E. L. Gaier and A. W. Flint (1958), "Interacting Effects of Control Motivation, Group Control and Problems Difficulty on Attempted Leadership", *Journal of Abnormal and Social Psychology*, 56 (5), 352-358

Beatty, Sharon E. and Scott M. Smith (1987), "External Search Effort: An Investigation Across Several Product Categories", *Journal of consumer Research*, 14 (June), 83-95

Bettman, J. R. and Michel A. Zins (1979), "Information Format and Choice Task Effects in Decision Making," *Journal of Consumer Research*, 6, 141-153

Bettman, J. R., (1975), "Issues in Designing Information Environments," *Journal of Consumer Research*, 2, 254-265

Bettman, J. R., E. J. Johnson and J. W. Payne (1991), "Consumer Decision Making", *Handbook of Consumer Behavior*, eds. T. S. Robertson and H. H. Kassarjian, Prentice Hall, New Jersey

Bettman, James R. and Pradeep Kakkar (1977), "Effects of Information Presentation Format on Consumer Information Acquisition Strategies", *Journal of Consumer Research*, 3 (4), 233-240

Biehal, Gabriel and Dipankar Chakravarti (1982), "Information-Presentation Format and Learning Goals as Determinants of Consumers' Memory Retrieval and choice Processes", *Journal of Consumer Research*, 8 (March), 431-441

Biehal, Gabriel and Dipankar Chakravarti (1983), "Information Accessibility as a Moderator of Consumer Choice", *Journal of Consumer Research*, 10, 1–14

Biehal, Gabriel and Dipankar Chakravarti (1986), "Consumer" Use of Memory and External Information in Choice: Macro and Micro Processing Perspectives", *Journal of Consumer Research*, 12, 382–405

Broadbent, D. E. (1958), *Perception and Communication*, New York, Pergamon

Brown, J. J., and P. H. Reingen (1987), "Social Ties and Word-of-Mouth Referral Behaviour", *Journal of Consumer Research*, 14 (December), 350-362

Brucks, Merrie (1985), "The Effects of Product Class Knowledge on Information Search Behavior", *Journal of Consumer Research*, 12 (June), 1-16

Brucks, Merrie and Paul H. Schurr (1990), "The Effects Of Bargainable Attributes And Attribute Range Knowledge on Consumer Choice Processes", *Journal of Consumer Research*, 16 (4), 409-419

Bruner, Gordon C., II.(1986), "Problem Recognition Styles and Search Patterns: An Empirical Investigation", *Journal of Retailing*, 62 (3), 281-297

Bruner, Jerome S. (1957), "On Perceptual Readiness", *Psychological Review*, 64,123-152

Bruner, Jerome S., J. J. Goodnow, and G. A. Austin (1956), *A Study of Thinking*, New York: John Wiley

Buckler, F. and H. Buxel (2000), *Mobile Commerce Report,* http://www.profitstation.

Budner, Stanley (1962), "Intolerance of Ambiguity as a Personality Variable", *Journal of Personality*, 30, 29-50

Campbell, D. J. (1988), "Task Complexity: A Review and Analysis", *Academy of Management Review*, 13 (1), 40-52

Carter, L. F., W. W. Haythorn and M. A. Howell (1950), "A Further Investigation of the Criteria of Leadership", *Journal of Abnormal and Social Psychology*, 46 (6), 589-595

Chaudhuri, Arjun (2000), "A Macro Analysis of the Relationship of Product Involvement and Information Search: The Role of Risk", *Journal of Marketing Theory and Practice*, 8 (1), 1-15

Childers, Terry L. and Michael J. Houston (1984), "Conditions for a Picture-Superiority Effect on Consumer Memory," *Journal of Consumer Research*, 11 (September), 643-54

Clarke, Irvine III (2001), "Emerging value propositions for M-commerce", *Journal of Business Strategies*, 18 (2), 133-148

Claxton, John, Joseph N. Fry and Bernard Portis (1974), "A Taxonomy of Prepurchase Information Gathering Patterns", *Journal of Consumer Research*, 1 (December), 35-42

Constantinides, Efthymios (2004), "Influencing the Online Consumer's Behavior: The Web Experience Internet Research", *Bradford*, 14 (2), pp. 111

Cox, Donald F. (1967), "The Influence of Cognitive Needs and Styles on Information Handling on Making Product Evaluations", in *Risk Taking and Information handling in Consumer Behavior*, ed., D. F. Cox, Boston: Harvard University Press, pp. 370-92

Craik, F. I. M., and R. S. Lockhart (1972), "Levels of Processing: A Framework for Memory Research," *Journal of Verbal Learning and Verbal Behavior*, 11, 671-684

Dabholkar, P. A. (1996), "Consumer Evaluations of New Technology-Based Self-Service Options: An Investigation of Alternative Models", *International Journal of Research in Marketing*, 13 (1), pp. 29-51

Daft, R. L., and R. H. Lengel (1984), "Information Richness: A New Approach To Managerial Behavior and Organization Design", *Research in Organizational Behavior*, 6, pp. 191-233

Daft, R. L., and R. H. Lengel (1986), "Organizational Information Requirements, Media Richness and Structural Design", *Management Science*, 32(5), pp. 554-571

Daft, R. L., R. H. Lengel, L. K. Trevino (1987), "Message Equivocality, Media Selection, and Manager Performance: Implications for Information Systems", *MIS Quarterly*, 11(3), pp. 355-366

Davis, F.D. (1989), "Perceived Usefulness, Perceived Ease of Use and User Acceptance of Information Technology", *MIS Quarterly*, September, pp. 319-340

Davis, F. D., R. P. Bagozzi and P. R. Warshaw (1992), "Extrinsic and Intrinsic Motivation to Use Computers in the Workplace", *Journal of Applied Social Psychology*, 22 (14), 1111-1132

Dawar, Niraj, Philip M. Parker and Lydia J. Price (1996), "A Cross-Cultural Study of Interpersonal Information Exchange", *Journal of International Business Studies*, 27 (3), 497-516

De Haan, A. (2000), "The Internet Goes Wireless", *EAI Journal*, April, 62-63

DeSanctis, G., and R. B. Gallupe (1987), "A Foundation for the Study of Group Decision Support Systems", *Management Science*, 33 (5), 589-609

Dholakia, Utpal M. (2001), "A Motivational Process Model of Product Involvement and Consumer Risk Perception", *European Journal of Marketing*, 35 (11/12), 1340-1360

Donabedian, B., S. M. McKinnon and W. J. Bruns (1998), "Task Characteristics, Managerial Socialization, and Media Selection", *Management Communication Quarterly*, 11 (3), 372-400

Dowling, Grahame R. and Richard Staelin (1994), "A Model of Perceived Risk and Intended Risk-Handling Activity", *Journal of Consumer Research*, 21 (June), 119-134

Duncan, Calvin P. and Richard W. Olshavsky (1982), "External Search: The Role of Consumer Beliefs", *Journal of Marketing Research*, 19 (1), 32-43

Durlacher (1999), *Mobile Commerce Report*, http://www.durlacher.com, 09/14/00

Engel, F. and R. D. Blackwell (1982), *Consumer Behavior*, 4th ed. New York: The Dryden Press

Engel, J. F., D. T. Kollat, and R. L. D. Blackwell (1973), *Consumer Behavior*, 21st Ed, Holt, Rinehart and Winston (Eds.), New York: Free

Eroglu, S. A., K. A. Machleit and L. M. Davis (2001), "Atmospheric Qualities of Online Retailing: A Conceptual Model and Implications", *Journal of Business Research*, Special Issue on Retail Strategy and Consumer Decision Research, 54, 177-184

Fern, Edward F. and Kent B. Monroe (1996), "Effect Size Estimates: Issues and Problems in Interpretation," *Journal of Consumer Research*, 23 (September), 89-115

Formisano, Roger A., Richard W. Olsahvsky and Shelly Tapp (1982), "Choice Strategy in a Difficult Task Environment," *Journal of Consumer Research*, 8, 474-479

Fowler, G. and M. Wackerbarth (1980), "Audio Teleconferencing Versus Face-to-Face Conferencing: A Synthesis of the Literature", *Western Journal of Speech Communication*, 44, 236-252

Furse, David H., Girish N. Punj and David W. Stewart (1984), "A Typology of Individual Search Strategies Among Purchasers of New Automobiles", *Journal of Consumer Research*, 10 (March), 417-431

Graham, John R. (2000), "Marketing Strategies for Businesses that are More 'Bricks' than 'Clicks'", *The American Salesman*, 45 (9), 19-25

Gregan-Paxton, Jennifer and Deborah Roedder John (1995), "Are Young Children Adaptive Decision Makers? A Study of Age", *Journal of Consumer Research*, 21 (4), 567-580

Grewal, R., J. Comer and R. Metha (2001), "An Investigation Into the Antecedents of Organizational Participation in Business-to-Business Electronic Markets", *Journal of Marketing,* 65 (3), pp. 17-23

Goldsmith, R. E. (1996), "Service Innovativeness and Price Sensitivity: An Exploratory Study", in Moore D. L. (Ed.), *Association of Marketing Theory and Practice Proceedings*, 5, pp. 85-91

Hansen, Flemming (1981), "Hemispherical Lateralization: Implications For Understanding Consumer Behavior," *Journal of Consumer Research*, 8, 23-36

Hays, W. L. (1973), *Statistics for the Social Sciences*, New York: Holt, Rinchart & Winston

Heaney, Joo-Gim and Ronald E. Goldsmith (1999), "External Information Search for Banking Services", *The International Journal of Bank Marketing*, 17 (7), pp. 305

Hedges, L. V. (1982), "Estimation of Effect Size from a Series of Independent Experiments," *Psychological Bulletin*, 92, 490-9

Henry, Walter A. (1980), "The Effect of Information processing Ability on Processing Accuracy," *Journal of Consumer Research*, 7, 42-48

Hoffman, D. L. and T. P. Novak (1996), "Marketing in Hypermedia Computer-Mediated Environments: Conceptual Foundations", *Journal of Marketing* 60, 50–68

Hogarth, Robin (1987), *Judgment and Choice*, New York: John Wiley

Hoque, A.Y. and G. L. Lohse (1999), "An Information Search Cost Perspective for Designing Interfaces for Electronic Commerce", *Journal of Marketing Research*, 36 (August), 387-94

Howard, John (1977), *Consumer Behavior: Application of Theory*, New York: McGraw-Hill

Howard, John and Jagdish Sheth, (1972), *The Theory of Buyer Behavior*, New York: Free Press

Hunter, John E. and Frank L. Schmidt (1990), *Methods of Meta-Analysis: Correcting Error and Bias in Research Findings*, Newbury Park: SAGE Publications

Jacoby, Jacob, Donald E. Speller and Carol Kohn Berning (1974), "Brand Choice Behavior as a Function of Information Load: Replication and Extension," *Journal of Consumer Research*, Vol. I, 33-42

Jacoby, Jacob, Donald E. Speller and Carol A. Kohn (1974), "Brand Choice Behavior as a Function of Information Load", *Journal of Marketing Research*, 11 (February), 63-69

Jacoby, Jacob, Robert W. Chestnut and William A. Fisher (1978), "A Behavioral Process Approach to Information Acquisition in Nondurable Purchasing", *Journal of Marketing Research*, 15 (4), 532-544

John, Deborah Roedder, Carol A. Scott and James R. Bettman (1986), "Sampling Data for Covariation Assessment: The Effect of Prior Beliefs on Search Patterns", *Journal of Consumer Research*, 13 (1), 38-47

Johnson, Eric J., Wendy W. Moe, Peter S. Fader, Steven Bellman and Gerald L. Lohse (2004), "On the Depth and Dynamics of Online Search Behavior", *Management Science*, 50 (3) pp. 299-309

Johnson, Eric and J. Edward Russo (1984), "Product Familiarity and Learning New Information", *Journal of Consumer Research*, 11 (June), 542-550

Junglas, Iris (2003), "U Commerce: An Experimental Investigation of Ubiquity and Uniqueness", Unpublished Dissertation, Department of MIS, University of Georgia

Kedia, B. L. and R. S. Bhagat (1988), "Cultural Constraints on Transfer of Technology Across Nations: Implications for Research in International and Comparative Management", *Academy of Management Review*, 13, 559-571

Kendall, M. G. and A. Stuart (1967), *The Advanced Theory of Statistics*, Vol. 2, 2nd ed. New York: Hafner

Kim, Chankon and Majeed Khoury (1987), "Task Complexity and Contingent Information Processing in the Case of Couple's Decision Making" *Journal of the Academy of Marketing Science*, 25 (Fall), 32-43

Klein, Lisa R. and Gary T. Ford (2003), "Consumer Search for Information in the Digital Age: An Empirical Study of Prepurchase Search for Automobiles", *Journal of Interactive Marketing*, 17 (3), 29-49

Laroche, Michel, Mark Cleveland and Elizabeth Browne (2004), "Exploring Age-Related Differences in Information Acquisition for a Gift Purchase", *Journal of Economic Psychology*, 25 (1), 61-95

Laurent, Giles and Jean-Noel Kapferer (1985), "Measuring Consumer Involvement Profiles", *Journal of Marketing Research*, 22 (February), 41-53

Lehman Brothers (2000), *Moving In Mobile Media Mode*, http://www.entsoftware.com, 09/14/00

Lehmann, Donald R. and Yigang Pan (1994), "Context Effects, New Brand Entry, and Consideration Sets", *Journal of Marketing Research*, 31 (3), 364-374

Lessard, Bill and Steve Baldwin (2003), *NetSlaves: True Tales of Working the Web*, McGrawHill Inc.

Locander, W.B. and P. W. Hermann (1979), "The Effect of Self-Confidence and Anxiety on Information Seeking in Consumer Risk Reduction", *Journal of Marketing*, 16, 269-275

Loiacono, Eleanor T., Richard T. Watson and Dale L. Goodhue (2002), "WebQual: A Measure of Website Quality", American Marketing Association Conference Proceedings, Chicago: 13; pp. 432

Lussier, Denis A. and Richard W. Olshavsky (1979), "Task Complexity and Contingent Processing in Brand Choice", *Journal of Consumer Research*, 6 (September), 154-165

Lynch, John G. and Thomas K. Srull (1982), "Memory and Attentional Factors in Consumer Choice: Concepts and Research Methods," *Journal of Consumer Research*, 9, 18-37

Malhotra, Naresh (1982), "Information Load and Consumer Decision Making," *Journal of Consumer Research*, 8, 419-430

Malhotra, Naresh K. (1982), "Information Load and Consumer Decision Making", *Journal of Consumer Research*, 8 (4), pp. 419-431 (12 pages)

Margolis, B. (1996), "Digital Commerce: The Future of Retailing", *Direct Marketing*, 58 (9), pp. 41- 50

Martin, Nora M. (2002), "Task-Technology Fit: Brick and Mortar Beware?", *Journal of American Academy of Business*, Cambridge. Hollywood: 1 (2), pp. 278-282

Mattila, Anna S. and Jochen Wirt (2002), "The Impact of Knowledge Types on the Consumer Search Process: An Investigation in the Context of Credence Services", *International Journal of Service Industry Management*, 13 (3/4), 214-229

Maute, Manfred F. and William R. Forrester, Jr. (1991), "The Effect of Attribute Qualities on Consumer Decision Making: A Causal Model of External Information Search", *Journal of Economic Psychology*, 12 (4), 643-666

Meuter, M. L., A. L. Ostrom, R. I. Roundtree and M. J. Bitner (2000), "Self-Service Technologies: Understanding Customer Satisfaction with Technology-Based Service Encounters", *Journal of Marketing*, 64 (3), pp. 50-64

McColl-Kennedy, Janet R. and Richard E. Fetter, Jr. (1999), "Dimensions of Consumer Search Behavior in Services", *The Journal of Services Marketing***,** 13 (3), 242-265

McGrath, J. E. (1984), *Groups: Interaction and Performance*, Prentice-Hall, Engelwood Cliffs, NJ

McGrath, J. E., and A. B. Hollingshead (1993), *Groups Interacting With Technology: Ideas, Evidence, Issues and An Agenda*, Sage Publications, Thousand Oaks, CA

Meyers-Levy, Joan (1989), "Priming Effects on Product Judgments: A Hemispheric Interpretation," *Journal of Consumer Research*, 16, 76-88

Midgley, David F. (1983), "Patterns of Interpersonal Information Seeking for the Purchase of a Symbolic Product", *Journal of Marketing Research*, 20 (1), 74-83

Mitra, Kaushik, Michelle C. Reiss and Louis M. Capella (1999), "An Examination of Perceived Risk, Information Search and Behavioral Intentions in Search, Experience and Credence Services", *The Journal of Services Marketing***,** 13 (3), 208-228

Moore, William L. and Donald R. Lehmann (1980), "Individual Differences in Search Behavior for a Nondurable", *Journal of Consumer Research*, 7 (3), 296-307

Moorthy, Sridhar, Brian T. Ratchford and Debabrata Talukdar (1997), "Consumer Information Search Revisited: Theory and Empirical Analysis", *Journal of Consumer Research*, 23 (4), 263-277

Nedungadi, Prakash (1990), "Recall and Consumer Consideration Sets: Influencing Choice Without Altering Brand Evaluations", *Journal of Consumer Research*, 17 (December), 263-276

Newell, A. and H. A. Simon (1972), *Human Problem Solving*, Englewood Cliffs, NJ: Prentice-Hall

Newell, A. and H. A. Simon (1981), "Computer Science as Empirical Inquiry: Symbols and Search", In J. Haugeland (Ed.), *Mind Design*, Cambridge, MA: MIT Press

Newman, Joseph (1977), "Consumer External Search: Amount and Determinants", in *Consumer and Industrial Buying Behavior*, A. Woodside, J. Sheth, and P. Bennett (eds.), New York: North-Holland: 79-94

Newman, Joseph W. and Richard Staelin (1972), "Pre-purchase Information Seeking for New Cars and Major Household Appliances", *Journal of Marketing Research*, 9 (August), 249-257

Nicosia, F.N. (1982), "Consumer Decision Processes: A Futuristic View," *Advances in Consumer Research*, 9, pp. 17-19

O' Neil, M. S., and J. F. Alexander (1971), "Family Interaction Patterns as a Function of Task Characteristics", *Journal of Applied Social Psychology*, 1 (2), 163-172

Olshavsky, Richard W. (1979), "Task Complexity and Contingent Processing in Decision Making: A Replication and Extension", *Organizational Behavior and Human Performance*, 24 (3), 300-316

Olshavsky, Richard W. and Michael Smith (1980), "A Taxonomy of Brand Choice Environments", In Proceedings of the 88th Annual Convention of the American Psychological Association (Division 23), Washington, DC: American Psychological Association, 145-154

Oorni, Anssi (2003), "Consumer Search in Electronic Markets: An Experimental Analysis of Travel Services", *European Journal of Information Systems*, 12 (1), 30-40

Ozanne, Julie, Merrie Brucks and Dhruv Grewal (1992) "A Study of Information Search Behavior During the Categorization of New Products", *Journal of Consumer Research*, 18 (4), 452-464

Painton, Scott and James W. Gentry (1985), "Another Look at the Impact of Information Presentation Format", *Journal of Consumer Research*, 12 (2), 240-245

Paquette, Laurence and Thomas Kida (1988), "The Effect of Decision Strategy and Task Complexity on Decision Performance", *Organizational Behavior and Human Decision Processes*, 41, 128-142

Park, C. Whan, Henry Assael and Seoil Chaiy (1987), "Mediating Effects of Trial and Learning on Involvement-Associated Characteristics", *The Journal of Consumer Marketing*, 4 (3), 25-34

Payne, John W. (1976), "Task Complexity and Contingent Processing in Decision Making: An Information Search and Protocol Analysis", *Organizational Behavior and Human Performance*, 16, 366-387

Payne, John W. (1977), "Heuristic Search Processes in Decision Making", In *Advances in Consumer Research*, 3, Ed. Beverlee Anderson, Ann Arbor, MI: Association for Consumer Research, 321-327

Payne, John W. (1982), "Contingent Decision Making", *Psychological Bulletin*, 92, 382-402

Poole, M. S. (1978), "An Information-Task Approach to Organizational Communication", *Academy of Management Review*, 3 (4), 493-504

Provost, Melanie (2004), "Web Health Information Seeking Self-Efficacy Scale: Development, Reliability and Validity", Unpublished Dissertation, Department of Pharmacy, University of Georgia, Athens, Georgia

Punj, Girish N. and Richard Staelin (1983), "A Model of Consumer Information Search Behavior for New Automobiles", *Journal of Consumer Research*, 9 (March), 366-380

Punj, Girish N., and David W. Stewart (1983), "An Interaction Framework of Consumer Decision Making", *Journal of Consumer Research*, 10 (2), 181-196

Putrevu, Sanjay and Brian T. Ratchford (1997), "A Model of Search Behavior with an Application to Grocery Shopping", *Journal of Retailing*, 73 (4), 463-486

Ratchford, Brian T., Myung-Soo Lee and Debabrata Talukdar (2003), "The Impact of the Internet on Information Search for Automobiles", *Journal of Marketing Research*, 40 (2), 193-209

Ratneshwar, S., C. Pechmann and A. D. Shocker (1996), "Goal-Derived Categories and the Antecedents of Across-Category Consideration", *Journal of Consumer Research*, 23 (3), 240-250

Ratneshwar, Srinivasan, Alla D. Shocker and David W. Stewart (1987), "Toward an Understanding the Attraction Effect: The Implications of Product Stimulus Meaningfulness and Familiarity," *Journal of Consumer Research*, 13, 520-533

Reichheld, F.F. and P. Schefter (2000), "E-Loyalty: Your Secret Weapon on the Web", *Harvard Business Review*, 78 (4), pp. 105-113

Rodgers, S. and E. Thorson (2000), "The Interactive Advertising Model: How Users Perceive and Process Online Ads", *Journal of Interactive Advertising* [On-line], Available: www.jiad.org/vol1/no1/rodgers/index.html

Rosenburg, L. and E. Hirschman (1980), "Retailing Without Stores", *Harvard Business Review*, 56 (4), pp. 103

Rosenthal, Robert (1991), *Meta-Analytic Procedures for Social Research*, Newbury Park, CA: Sage Publications

Rosenthal, Robert and D. B. Rubin (1982), "Comparing Effect Sizes of Independent Studies," *Psychological Bulletin*, 92, 500-504

Rothschild, Michael L., and Yong J. Hyun (1990), "Predicting Memory For Components of TV Commercials From EEG," *Journal of Consumer Research*, 16, 472-484

Rubin, A.M. (1994), "Media Uses and Effects: A Uses and Gratifications Perspective", In J. Bryant and D. Zillmann (eds.), *Media effects: Advances in Theory and Research*, Hillsdale, NJ: Lawrence Erlbaum, pp. 417–436

Sawyer, Alan G. and J. Paul Peter (1983),"The Significance of Statistical Significance Tests in Marketing Research", *Journal of Marketing Research*, 20 (2), pp. 122-134

Scammon, Debra (1977), "Information Overload and Consumers," *Journal of Consumer Research*, Vol. 4, 148-155

Schaninger, Charles M. and Donald Sciglimpaglia (1981), "The Influence of Cognitive Personality Traits and Demographics on Consumer Information Acquisition", *Journal of Consumer Research*, 8 (2), 208-216

Shapiro, Stewart, Deborah J. MacInnis and Susan E. Heckler (1997), "The Effects of Incidental Ad Exposure on the Formation of Consideration Sets", *Journal of Consumer Research*, 24 (1), pp. 94-104

Shaw, M. E. (1954), "Some Effects of Problem Complexity Upon Problem Solution Efficiency in Different Communication Nets", *Journal of Experimental Psychology*, 48 (3); 211-217

Shaw, M. E. (1973), "Scaling Group Tasks: A Method For Dimensional Analysis", *JSAS Catalog of Selected Documents in Psychology*, 3, 8-8

Sheehan, Kim Bartel (2002), "Of Surfing, Searching and Newshounds: A Typology of Internet Users' Online Sessions", *Journal of Advertising Research*, (September/October) 62-71

Sheluga, David A., James Jaccard and Jacob Jacoby (1979), "Preference, Search, and Choice: An Integrative Approach", *Journal of Consumer Research*, 6 (2), 166-176

Simon, Herbert A. (1955), "A Behavioral Model of Rational Choice", *Quarterly Journal of Economics*, 69 (February), 99-118

Smith, J. Brock and Julia M. Bristor (1994), "Uncertainty Orientation: Explaining Differences in Purchase Involvement and External Search", *Psychology and Marketing*, 11 (6), 587-617

Smith, Michael D. (2002), "The Impact of Shopbots on Electronic Markets", *Academy of Marketing Science, Journal*, 30 (4), pp. 446-455

Srinivasan, Narasimhan and Brian T. Ratchford (1991), "An Empirical Test of a Model of External Search for Automobiles", *Journal of Consumer Research*, 18 (2), 233-242

Staelin, Richard and J. Payne (1976), "Studies of Information Seeking Behaviour of Consumers", in J. Carroll and J. Payne, (eds.), *Cognitive and Social Behavior*, Erlbaum and Associates, Hillsdale, NJ

Steiner, I. D. (1972), *Group Process and Productivity*, Academic Press, New York

Stigler, George J. (1961), "The Economics of Information", *Journal of Political Economy*, 72 (3), 44-61

Suh, Kil Soo (1999), "Impact of Communication Medium on Task Performance and Satisfaction: an Examination of Media-Richness Theory", *Information & Management*, 35, 295-312

Szymanski, D.M. and R.T. Mise (2000), "E-Satisfaction: An Initial Examination", *Journal of Retailing*, 76 (3), pp. 309-322

Thurow, L. (2001), "Does 'E' in E-Business Stand for 'Exit'?", *MIT Sloan Management Review*, 42 (2), pp. 112-113

Torkzadeh, Gholamreza, and Gurpreet Dhillon (2002), "Measuring Factors that Influence the Success of Internet Commerce", *Information Systems Research,* 13 (2), pp. 187-207

Urbany, Joel E. (1986), "An Experimental Examination of the Economics of Information", *Journal of Consumer Research*, 13 (2), 257-271

Urbany, Joel E., Peter R. Dickson and William L. Wilkie (1989), "Buyer Uncertainty And Information Search", *Journal of Consumer Research*, 16 (2), 208-214

Vessey, I. (1991), "Cognitive Fit: A Theory-Based Analysis of the Graphs Versus Tables Literature" *Decision Sciences*, 22, 219-240

Waite, K. and T. Harrison (2002), "Consumer Expectations of Online Information Provided by Bank Websites", Paper presented at Academy of Marketing Conference, Nottingham, UK, July 2-4

Weber, Elke U., and William P. Bottom (1990), "An Empirical Evaluation of the Transitivity, Monotonicity, Accounting, and Conjoint Axioms for Perceived Risk", *Organizational Behavior And Human Decision Processes*, 45 (2), 253-276

Westbrook, Robert A. and Richard L. Oliver (1991), "The Dimensionality of Consumption Emotion Patterns and Consumer Satisfaction", *Journal of Consumer Research*, 18 (1), pp. 84-92

Wilkie, W. L., and P. R. Dickson (1985), "Consumer Information Search and Shopping Behavior" *Management Science Institute paper series*, Cambridge, MA

Wolf, Fredric M. (1986), *Meta-Analysis: Quantitative Methods for Research Synthesis*, Beverly Hills, CA: Sage Publications, Inc.

Wood, R. E. (1986), "Task Complexity: Definition of the Construct", *Organizational Behavior and Human Decision Processes*, 37 (1), 60-82

Wright, P. L. (1974), "The Harassed Decision Maker: Time Pressures, Distractions and the Use of Evidence," *Journal of Applied Psychology*, 59, 555-561

Yang, Kenneth C.C. (2004), "Effects of Consumer Motives on Search Behavior Using Internet Advertising", *Cyberpsychology and Behavior*, Vol. 7 (4), pp. 430-442

Yoon, S. (2002), "The Antecedents and Consequences of Trust in Online-Purchase Decisions", *Journal of Interactive Marketing*, 16 (2), pp. 47-63

Zabala, H. (2000), "M-commerce, The Next Big Thing?", *Asian Business*, June, 34-35

Zauberman, Gal (2003), "The Intertemporal Dynamics of Consumer Lock-In", *Journal of Consumer Research*, 30 (3), pp. 405

Zeithaml, V. A., A. Parasuraman and A. Malhotra (2000), "A Conceptual Framework for Understanding E-Service Quality: Implications for Future Research and Managerial Practice", Working Paper, Marketing Science Institute, Cambridge, MA

Zigurs, I. and B. K. Buckland (1998), "A Theory of Task/Technology Fit and Group Support Systems Effectiveness", *MIS Quarterly*, 22(3), 313-334

Zimmermann, Linda K. and Loren V. Geistfeld (1984), "Economic Factors Which Influence Consumer Search for Price Information", *The Journal of Consumer Affairs*, 18 (1), 119-130

APPENDIX A: Consent Form

Information Search Study Consent Form**è**

I, _____ agree to take part in the research titled "Investigating Differences in Search Behavior: In-Store, E-Commerce, M-Commerce" conducted by Ms. Moutusi Maity (706 542 3764) under the guidance of Dr. George M. Zinkhan (706 542 3757) from the Marketing and Distribution department at the Terry College of Business, University of Georgia. I understand that I do not have to take part if I do not want to. I can stop taking part without giving any reason, and without penalty. I can ask to have all of the information about me to be returned to me, removed from the research records, or destroyed.

The reason for this study is to understand search processes differences in three different search modes.

If I volunteer to take part in this study:

a) I shall undergo a training session (approx 5 minutes),
b) I shall be asked to undertake a task which involves making choice decisions and answer some questions regarding the task (approx 15 minutes),
c) I will be asked to read a story (or, solve a puzzle) (approx 5 minutes)
d) I shall be asked to undertake a second task which involves making choice decisions and answer some questions regarding the task (approx 15 minutes),
e) I will be asked to solve a puzzle (or, read a story) (approx 5 minutes)
f) I shall be asked to undertake a third task which involves making choice decisions and answer some questions regarding the task (approx 15 minutes), and
g) No responses will be audio-taped ore video-taped.

Upon completion of the study, I shall be given an extra class credit and be entered into a sweepstakes drawing for 5 gifts of $30.00 each. The five winners will be decided by a random drawing of all participants.

There is no risk expected by participating in this study. The investigators will answer any further questions about the research, now or during the course of the project (706-542-3764).

I understand that I am agreeing by my signature on this form to take part in this research project and understand that I will receive a signed copy of this consent form for my records.

No information about me or provided by me during the research, will be shared with others without my written permission, except for giving me class credit or if required by law. I will be assigned an identifying number and this number will be ised on all of the questionnaires I fill out.

_____ _____

Investigator's Signature Date Participant's Signature Date

Participant's Name : _____

Investigator's Phone No. : (706) 542 3764

Investigator's E-mail : mmoutushi@yahoo.com

è Questions or problems regarding your rights as a participant should be addressed to Chris A. Joseph, Ph.D., Human Subjects Office; The University of Georgia; 612 Boyd Graduate Studies Research Center; Athens; GA 30602-7411; Phone: 706-542-3199; e-mail: IRB@uga.edu.

APPENDIX B: Scales Used

Variable	Measure	Scale
Satisfaction	"This is one of the best experiences I had in making a decision." "This experience of decision-making is exactly what I needed." "This experience of decision-making hasn't worked out as well as I thought it would." "I am satisfied with the experience." "I have mixed feelings with the experience." "If I could do it over again, I would not have made the decision using an e-commerce environment." "I feel bad about using an e-commerce environment." "I'm sure it was the right thing for me to use an e-commerce environment."	7-point Likert
Perceived Enjoyment	"I had fun interacting with the e-commerce environment." "Using the e-commerce environment provided me with a lot of enjoyment." "I enjoyed using a the e-commerce environment."	7-point Likert
Search Effort	"I searched for a lot of information." "I used many information cues." "I could not be bothered to look for any more information."	7-point Likert

Perceived Cost	"I felt it took a lot of effort to search." "I felt it took a lot of time to search." "I was facing time constraints." "I had little time to search." "I had to make a quick decision."	7-point Likert
Perceived Complexity	"This decision-making task is a complex one." "The complexity-level of this task is high." "This is an easy task."	7-point Likert
Perceived Fit	"This task is best carried out in an e-commerce environment." "An e-commerce environment is the most conducive for carrying out this task."	7-point Likert
Role of Memory	"In making the second choice in an e-commerce environment, I used only the information presented to me the second time." "In making the second choice in an e-commerce environment, I used only the information presented to me the first time." "In making the second choice in an e-commerce environment, I relied mostly on the information presented to me the first time." "In making the second choice in an e-commerce environment, I relied mostly on the information presented to me the second time."	7-point Likert
Media Richness	While shopping at online stores, the e-commerce[39] environment helps me in making a good decision.	7-point Likert

[39] "E-commerce" is replaced with "In-Store" OR "m-commerce" for the other two modes of search

	While shopping at online stores, when I do not understand a piece of information, the e-commerce environment makes it more difficult for me to come to a decision. While shopping at online stores, the conditions provided by an e-commerce environment slow down the decision-making process. While shopping at online stores, the e-commerce environment makes it more easy for me to come to a decision. While shopping in an e-commerce environment, I can easily understand things. An e-commerce environment helps me reach a decision quickly.	
Loyalty	"I intend searching for information and making a purchase decision in an e-commerce environment." "I shall recommend others to search for information and make a purchase decision in an e-commerce environment."	7-point Likert
Self-Efficacy of Information Search	"I feel confident using the computer to access a new Website I have never used before." "I feel confident that I could find resources on the Web if I used a computer." "I feel confident finding resources on the Web by myself using a computer." "I feel confident finding resources on the Web using a computer as long as I have plenty of time to search." "I feel that I could find resources on the Web using a computer through a general search engine (E.g., Google, Yahoo!, AOL)."	7-point Likert

Perceived Risk	"Using the e-commerce environment for search does not inconvenience me." "Using the e-commerce environment may lead to adverse consequences." "It is probable that using the e-commerce environment could lead to negative consequences." "I feel that there are uncertainties involved when making a decision in the e-commerce environment."	7-point Likert
Service Type	"I could collect knowledge or information about purchasing airlines ticket before purchasing it." "I could determine if the service provided while purchasing airlines ticket was "good" or "bad" immediately after the service was performed." "I could not confidently judge how "good" or "bad" the service (purchasing airlines ticket) quality was any time in the near future."	7-point Likert
Tolerance of Ambiguity	"A good job is one where what is to be done and how it is to be done are always clear." "In the long run it is possible to get more done by tackling small, simple problems rather than large and complicated ones." "What we are used to is always preferable to what is unfamiliar." "It is more fun to tackle a complicated problem than to solve a simple one."	7-point Likert
Price Sensitivity	"In general, the price or cost of buying is important to me." "I am less willing to buy a product if I think that it will be high in price."	7-point Likert

	"A really good product is worth paying a lot of money for." "I don't mind spending a lot of money to buy a product."	
Perceived Difference Among Search Modes	"The decision-making experiences on a PDA (mobile device) is very similar to the ones in the e-commerce environment." "The decision-making experiences on the PDA is very similar to the ones in the in-store environment." "The decision-making experiences in the in-store is very similar to the ones in the e-commerce environment." A PDA is very different from an in-store environment. An e-commerce environment is very different from a mobile commerce (PDA) environment.	7-point Likert
Need for Cognitive Clarity	X is on a motor trip through the country. As evening approaches he finds himself in an unfamiliar area, lost. He is also terribly hungry. He decides to eat first and worry about finding his way later. **You would act this way**. A woman is engaged in a heated argument with several close friends. She would like to continue arguing because she needs further clarification of the point under discussion, but decides to stop because she fears offending them. **You would act this way**. A hunter who has been in the woods for over eight hours discovers that he has lost his way. He is severely fatigued but resolves to attempt finding his way out of the forest before resting. **You would act this way**.	7-point Likert

	A woman is debating a club problem with fellow members of her club. She begins to realize that there are some inconsistencies which she would like to clear up but that if she continues to argue she will be disloyal to the other members. However, she continues with the debate in spite of increasing hostility. **You would act this way**. J has met a beautiful girl. They go out together a number of times – finally they fall into each other's arms. They are about to elope when the girl says: "There is something you should know about my past." J says: "Tell me some other time." **You would act this way**. D is at home trying to clear up a problem which has perplexed her for some time and about which she is quite concerned. She has several hours of work ahead of her before she can get the answer. Suddenly she glances out of the window and notices that it is a wonderful spring day. She feels like going outside but decides to contain herself and remain at work. **You would act this way**. S is lying in bed reading a good novel. She comes upon a word she doesn't understand and is bothered by the confusion. However, she is so comfortable that she rejects the idea of going across the room to look up the word in the dictionary. **You would act this way**. N has the choice of accepting or rejecting an important job with the counterintelligence corps in which he will be well paid but not be able to find out how his work fits into the larger scheme of things. He decides to reject the job because of the latter consideration. **You would act this way**.	

Task Relevancy	A person can ask a friend to buy an airlines ticket for him/her (and make the payment later). My friend can ask me to buy an airlines ticket for him/her (and pay me later). Buying an airlines ticket for a friend might be a real situation for me (provided he/she pays me later). I will never buy any airlines ticket for a friend (even if he/she pays me later). I could buy an airlines ticket for a friend (provided he/she pays me later).	7-point Likert