Impact of Online Pre-purchase Search on Consumer Satisfaction

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ABSTRACT: Consumers frequently engage in pre-purchase search to extract up-to-date information for their purchase decisions. Search is an essential part of comparison-shopping and decision-making process as it reduces purchase related uncertainty and increases the likelihood of purchase satisfaction. In this paper, we examine the relation of purchase satisfaction and classic determinants of pre-purchase search, measures of purchase related uncertainty, and the type of the search process. We find that only one classic determinant, involvement, influences satisfaction. Instead, we did not find any evidence of the influence of other classic determinants such as product class knowledge, time availability, attitudes toward shopping, and search effort. Moreover, we found that purchase related uncertainties (evaluation uncertainty, choice uncertainty, and implementation uncertainty) and iterative search process are the strongest determinants of satisfaction.

KEYWORDS: comparison shopping, consumer online pre-purchase search behavior, external search determinants, uncertainty, satisfaction, travel purchase, search pattern

1   Introduction

"… and a man comes on the radio
he's tellin' me more and more
about some useless information
supposed to fire my imagination.
* I can't get no, oh no no no…"*
(M. Jagger/K. Richards)

Consumer search is the main method, besides advertising, for acquiring information necessary to purchase decisions. Consumers look for products with desired qualities and sellers offering these products at competitive prices in an attempt to decide what, when, and from whom to purchase. Identification of prospective products and sellers is a primary source of uncertainty. Search is needed also because sellers and buyers enter and leave the markets, new products are introduced, and prices fluctuate as production costs vary (Stigler 1961). Another, yet related, cause is consumers' inability to ascertain product quality and seller reliability before the purchase decision; it may take a lengthy period of use to determine the quality. Information search is costly, which prohibits consumers from obtaining extensive market knowledge, resulting in price dispersion in most consumer markets. Absence of search costs would, in theory at least, enable consumers to make consistently well informed purchase decisions, and thus improve market efficiency.

Electronic markets benefit from increasing productivity of information technology, since product information can be disseminated at increased speed, quantity, and quality (Malone, Yates et al. 1989). Enhanced exchange of information is commonly believed to mollify information related market imperfections by allowing consumers to update their market knowledge more extensively than what is feasible in most conventional consumer markets (Bakos 1997). While increasing performance/price ratio of information and telecommunication technology is a fact, it is less clear if improvement in data transmission alone will substantially enhance the markets by driving down search costs. Empirical evidence seems to point to the contrary (Brynjolfsson and Smith 2000; Öörni 2003). Low cost of data transmission guarantees that information can be amassed in great quantities, yet, it simultaneously raises the problem of sifting information. Information search is further complicated by the difficulty of validating information and these complications are expected to continue to exist in electronic consumer markets (see e.g. Whinston, Stahl et al. 1997).

It seems evident that the future development of electronic consumer markets crucially hinges on development of more advanced shopping aids that will enable consumers not only retrieve and sift product information but also help assess this information, judge products and sellers, and even evaluate their purchase related preferences. This all amounts to the development of electronic shopping aids being guided by the needs of the consumer. While the previous statement may seem obvious even to a casual spectator, realization of consumer oriented technology continues to be a challenge for our understanding of consumer behavior remains far from perfect despite the substantial progress that has been made over the past few decades. The complexity of consumer decision phenomenon is depicted by the notion that more than 60 determinants have been related to the amount of pre-purchase consumer search (Schmidt and Spreng 1996) alone. Yet, we still regularly fall short of being able to attribute purchase related satisfaction to its constituents.

In this paper, we aim to advance development of electronic shopping aids by identifying the most important factors influencing the outcome of search in electronic consumer markets. A number of contingency factors of search have been found to affect external search effort (see e.g. Bettman 1979) and these factors manifestly interact (Punj and Staelin 1983; Beatty and Smith 1987). According to consumer behavior literature, the combination of information sources used to search is likely to be contingent, at least, on individual characteristics, product class, and the environment of search (Bettman, Johnson et al. 1990). This trinity of influences seems to dominate consumer search literature in various combinations and conceptualizations. Our analyses suggest that we can reduce the determinants of purchase related satisfaction into the following set of factors: prior uncertainty, product class involvement, and type of the search process.

2   Theory

Consumer satisfaction has emerged as one of the central concepts of consumer centric business for it has been related to desired outcomes in consumer relations, such as brand loyalty (Bloemer and Kasper 1995), repurchase intentions (He, Chan et al. 2008; Leingpibul, Thomas et al. 2009), recommending (Paul and Robin 2004), and complaining (Jeanne, Maureen et al. 2001; Richard and Anand 2001). As a result, consumer satisfaction is seen as a worthwhile interim goal in the pursuit of profitable retail business. While the definitions of consumer satisfaction are varied, they all agree that satisfaction is a response (emotional or cognitive) pertaining to a particular focus determined at a particular time (Giese 2000). For the purposes of the current study, we define consumer satisfaction as a purchase self-evaluation of the purchase.

Consumer satisfaction has been theoretically connected to cost savings and amount of external information search as its antecedents (Punj and Staelin 1983). The varied measures of search effort (Newman 1977; Punj and Staelin 1983; Srinivasan and Ratchford 1991; Bettman, Luce et al. 1998) substantially complicates identification of the primary antecedents of satisfaction among the large number of factors related to external search (see Schmidt and Spreng 1996). We elect to concentrate on those measures which have a clear theoretical relation to the dependent measure of interest, purchase satisfaction.

We have identified the works of Punj and Staelin (1983) and Beatty and Smith (1987) as a fruitful starting point. The former related amount of search and its antecedents to purchase related satisfaction while the latter refined the determining variables into a set of four constructs: 1) product class knowledge, 2) time availability, 3) purchase involvement, and 4) attitudes towards shopping. As past research has acknowledged that amount of search does not completely subsume their effect on search, we elect to include the amount of search in the set of independent variables. The economics of information stream of research adds two determinants to our set of determinants, uncertainty (Stigler 1961) and type of the search process (see, e.g. Whinston, Stahl et al. 1997, pp. 265-6), both of which have been related to the quality of the purchase decision. We will next discuss the constructs of Beatty and Smith in more depth followed by discussions of purchase related uncertainty and type of search process.

2.1   Product Class Knowledge

Punj and Staelin (1983, p. 368) distinguished between organization of product information and actual product attributes. They included in the concept of Prior Memory Structure "the consumer's knowledge of the buying process as well as knowledge associated with [the product category] in general". The concept has since been adopted under the labels of Product Class Knowledge (Brucks 1985) and Product Category Knowledge (PCK) (Fiske, Luebbehusen et al. 1994). Studies focusing on PCK have usually identified positive association between knowledge and the magnitude of search effort (Brucks 1985). Usable Prior Knowledge (Punj and Staelin 1983, p. 368), on the other hand, refers to the actual, detailed information accumulated. The concept has since received multiple labels, yet, the one that seems to enjoy the most widespread acceptance is Brand Knowledge (BK) (e.g. Brucks 1985; Fiske, Luebbehusen et al. 1994). Brand knowledge has often been found to limit search through a de-motivating effect: The more consumers have accumulated detailed product information, the less benefit they perceive in search.

Brand knowledge and product category knowledge show signs of being related as they tend to develop in tandem (Fiske, Luebbehusen et al. 1994). They do not, however, seem to share all of their antecedents: "Specific product-class information is gained by using the product in everyday activities, while directly relevant purchase-task information is obtained each time a person goes through the task of buying … ." (Punj and Staelin 1983) Hence, the two types of knowledge are usually seen conceptually distinct types, the PCK capturing the evaluative dimension and BK the actual product details. This distinction can also be found in Urbany's (1986) characterization of abstract (i.e. product category related) and concrete product related knowledge. Fiske et al. (1994) suggest two reasons to distinguish between BK and PCK. "First, the two constructs may have different effects on search behavior. Second, while BK and PCK likely develop in tandem over time, there are many situations in which existing PCK is relevant to a search problem, yet BK is not (e.g., when a consumer moves to a new market or several new brands have been introduced since the last purchase)."

H1: High product class knowledge has a positive effect on purchase satisfaction.

2.2 Time availability

Empirical evidence indicates that consumers reach relatively quickly the point where the perceived cost of search is higher than the expected benefits. Consumers rarely visit more than one or two shops even when buying high-ticket consumer durables (e.g. Newman and Staelin 1972; Wilkie and Dickson 1985). Crowell and Bowers (1977) have shown that, in particular, the cost of a consumer's time determines to a great extent how much search is feasible. The value of time is a controversial topic. Clearly, the opportunity cost of time varies from consumer to consumer. Furthermore, Leclerc et al. (1995) have shown that the value of a consumer's time is not constant but depends on contextual factors.

Time constraints profoundly affect the difficulty of the decision. Increased time constraints have been found to lead the decision-maker to simplify the task at hand (Wright 1974), to accelerate the information processing (Ben Zur and Breznitz 1981), to selectively focus on information (Miller 1960), and to change the decision strategy employed (Payne, Bettman et al. 1988). Likewise, an increase in the number of alternatives may lead consumers to simplify their information processing.

H2: High time constraints are related to purchase dissatisfaction.

2.3 Purchase involvement

Schmidt and Spreng (1996) suggest that involvement (Krugman 1965) influences motivation to search. The degree of personal involvement has also been found a key factor in shaping the type of decision process that consumers will follow (Blackwell, Miniard et al. 2001, p. 91). Antil (1994) defines involvement as the "level of perceived personal importance and/or interest evoked by a stimulus within a specific situation". Consumer behavior literature identifies three sets of factors influencing purchase involvement: 1) personal factors, 2) product factors, and 3) situational factors (Blackwell, Miniard et al. 2001, p. 91). Personal factors are relatively enduring and include self-image, looks, and health, among others. Product factors are largely related to risks in purchasing or using the product: risk of misinvestment, or risk of bodily harm. Situational factors are related to mode of consumption: whether the product is bought as a gift, whether the product is bought for personal consumption or to be consumed in company of others, such as a vacation.

H3: High levels of involvement are related to high levels of purchase satisfaction.

2.4 Attitudes toward shopping

Beatty and Smith (1987) theorized that attitudes towards shopping, a construct closely related to purchase involvement but directed towards the process of purchasing rather than the product class, are strong candidates for determining the amount of search. They based their view on previous findings about the strong positive relationship between attitudes towards pre-purchase search and actual search behavior (Kiel and Layton 1981; Duncan and Olshavsky 1982; Punj and Staelin 1983). Of particular interest are the observations of Duncan and Olshavsky (Duncan and Olshavsky 1982), which demonstrate a strong relationship between attitudes toward shopping and regret avoidance: "when important purchase are made quickly, they are usually regretted".

More recent research has also highlighted the impact of attitudes towards toward shopping on the search effort: Schmidt and Spreng (1996), for example, propose that motivation to search is affected by shopping enthusiasm (Babin, Darden et al. 1994). Several studies have also demonstrated that consumers' attitudes toward shopping continue to influence their behavior in the electronic markets as well (Fiore, Jin et al. 2005; Mummalaneni 2005). A typical finding is that consumers who find Internet shopping pleasant search for more information. Hence, positive attitude should, in theory at least, lead to better purchase decisions.

H4: Positive attitude towards Internet shopping is related to purchase satisfaction.

2.5 Search effort

The economics of information theory is based on the premise that buyers do not fully inform themselves about the alternatives available in the markets because of high search costs (Stigler 1961; Ratchford 1982). The theory implies that both the benefits and the costs of search are related to the number of alternatives considered. Thus, it is more likely that good alternatives are included in the subset of products considered as the size of the consideration

set increases. The economics of information theory further implies that, in terms of benefits of search, the returns are sharply diminishing. Every additional alternative examined offers a smaller potential increase in benefits than the previous ones. The cost of searching for an additional alternative tends to increase. As it takes progressively more effort to locate new offerings, a point is reached at which the expected cost of considering an additional alternative exceeds the potential increase in benefits. Empirical evidence indicates that consumers relatively quickly reach the point where the perceived cost of search is higher than the expected benefits. Consumers rarely visit more than one or two shops even when buying high-ticket consumer durables (Newman and Staelin 1972; Wilkie and Dickson 1985).

Alba et al. (1997), while discussing the merits of interactive home shopping (IHS), posit that the vast number of alternatives available to consumers is a significant benefit of IHS compared with other retail formats. Bakos (1997) suggests that declining search costs in the electronic markets will enable consumers to engage in more extensive pre-purchase search. Thus, consumers should be able to extend their pre-purchase information search, yet it is not clear which dimensions of the search effort will be affected most. Literature on electronic market efficiency proposes that consumers will visit a higher number of retailers (Bakos 1991b; Bakos 1997; Bakos 1998). This hypothesis is based on the assumption that products are either homogeneous or the consumer has an existing preference structure for the decision and has already narrowed search down to a few brands and, thus, focus on price comparison.

In reality, it is easy to observe that most consumer products are heterogeneous – even if they differ only by brand. Furthermore, it is argued that consumer choice is inherently constructive. Due to limited processing capacity, consumers often do not have well-defined existing preferences; the preference structure is instead constructed during the search process using a variety of strategies contingent on task demands (Bettman, Luce et al. 1998). Thus, the number of sellers appears to be an insufficient measure for the search effort and more measurement dimensions are warranted. In consumer search literature, a number of gauges have been suggested for the measurement of the extent of search. These measures include, besides time spent in the process, number of retail stores visited, and number of alternatives considered (Newman 1977; Punj and Staelin 1983; Srinivasan and Ratchford 1991; Bettman, Luce et al. 1998).

> *H5: The search effort, measured by the number of sellers visited, and number of alternatives considered is related to purchase satisfaction.*

2.6   Uncertainty

Uncertainty is one of the central concepts in consumer behavior literature. It captures the lack of the individual's control over how future is going to unfold. Future events are difficult to foresee mostly because consumer environments are both complex and in constant change. Changing identity of sellers and buyers, and fluctuation in supply and demand result in uncertainty since information becomes obsolete (Stigler 1961). Consumers must therefore update their information, and there is often no better means to do that than search. Accordingly, Lanzetta (1963) posited that higher levels of uncertainty should lead to more extensive search, and search activity has been observed to increase with uncertainty (Lanzetta and Driscoll 1968). What is more, consumers typically can't know or predict accurately the amount of knowledge they already have. It has been demonstrated that people are sensitive to uncertainty even if their ability to substantiate this uncertainty is often quite limited (Lichtenstein and Fischhoff 1977). What is more, uncertainty may encourage as well as discourage problem solving as both complete certainty and complete uncertainty are likely to inhibit action (Dewey 1910, p. 9, 112).

The position that uncertainty and search are related has received considerable empirical support: several constructs indicative of uncertainty (e.g. low prior knowledge, unfamiliarity, inexperience) have been found to relate to search (for an extensive review, see e.g. Fiske, Luebbehusen et al. 1994). What heightens the importance of uncertainty as a predictor is the failure of many other, theoretically sound concepts to determine consumer search. Yet, despite its prevalence in consumer behavior theories, uncertainty the concept remains surprisingly vague. Few efforts have been made to address its composition, Urbany et al. (1989) and Moorthy et al. (1997) being among the notable exceptions. We extend the work of Urbany et al. (1989), who identified two dimensions of uncertainty, knowledge uncertainty and choice uncertainty, as possible determining factors of consumer pre-purchase search.

Urbany et al. (1989) suggested that uncertainty is a multidimensional construct, and its effect on consumer search may be conditional to the dominant form of uncertainty present in the purchase decision. The authors distinguished two types of uncertainty, labeled knowledge uncertainty (KU) and choice uncertainty (CU). Knowledge uncertainty captures doubts consumers have about their own ability to judge sellers and products well enough to execute reasonable product comparisons, whereas choice uncertainty arises from the conflict about which

alternative to choose (Urbany 1986; Urbany, Dickson et al. 1989). While the former construct is likened to the original idea of uncertainty put forth by Stigler (1961), the latter is reminiscent of "response uncertainty" coined by Lanzetta (1963), who, referring to Berlyne (1960), stated that uncertainty occurs when the "choice of the best alternative is equivocal" in the context of resolving a conflict. Urbany et al. (1989) acknowledged that their uncertainty constructs were highly correlated, which they interpreted suggesting the presence of yet another dimension of uncertainty, labeled evaluation uncertainty (EU). Theoretical support for such a proposition can be found in decision making literature in which uncertainty has been tagged as an antecedent of judgment (Dewey 1910, p. 9, 102).

Both Dewey and later decision making theorists have usually identified four steps in the decision process. While John Dewey (1910) introduced the notion of decision making as a sequence of decomposed stages that converge on a solution, Herbert Simon (see e.g. 1960, p. 2) established the dominant model of the decision-making process as a three phase "intelligence-design-choice" sequence (Langley, Mintzberg et al. 1995), which was later supplemented with a fourth stage of "implementation" as many authors felt it significant enough to be shown separately (see e.g. Sprague Jr. and Carlson 1982, pp. 26-27). As the previously discussed uncertainties cover only the first three steps of decision making, we propose that a fourth type of uncertainty, implementation uncertainty (IU), should be added to the host of pre-purchase uncertainties. We expect that the search effort will subsume some of the influence of uncertainty as suggested by Urbany et al. (1989), yet, any residual uncertainty will likely have negative impact on purchase satisfaction.

> H6: Pre-purchase uncertainties (Knowledge Uncertainty, Choice Uncertainty, Evaluation Uncertainty, and Implementation Uncertainty) are related to purchase dissatisfaction.

2.7   Search process

Uncertainty amplifies need for information processing capacity, which is finite. According to Herbert Simon decision making is often hampered significantly by the limited human cognitive ability: "The capacity of the human mind for formulating and solving complex problems is very small compared with the size of the problems whose solution is required for objectively rational behavior in the real world." (Simon 1957, p. 198) Thus, not only objectively rational problem solving but also problem formulation is often beyond human cognitive capabilities. Building on bounded rationality, championed by Simon (1955; 1957), Bettman et al. (1998) have proposed that, "due to limited processing capacity, consumers often do not have well-defined existing preferences, but construct them using a variety of strategies contingent on task demands."   In this context, the search process is not characterized by evaluation of products against an existing set of decision criteria. Rather, search is necessary for the consumer to be able to identify the procurement criteria and their relative importance.

Experienced and inexperienced consumers often resort to different types of search patterns. While experienced consumers utilize largely the information already in their long-term memory, inexperienced consumers have to retrieve this information from the environment. The former search pattern is often depicted as simultaneous search (see figure 1 in essay 2), consisting of a single information retrieval phase followed by the decision. Sequential search, on the other hand, often comprises multiple consecutive information retrieval and decision phases, each of which contributes to the total search cost. Whinston et al. (1997, p. 267) suggest that online search technology may automate the search process and enable consumers to execute more sophisticated and efficient searches. It holds the promise of shifting search increasingly from the domain of sequential search towards simultaneous search. There are, however, prerequisites related to consumer preferences that have to be satisfied before such transformation is possible. In particular, consumers should have stable preference structures to be able to accurately model the decision problem at hand. As pure simultaneous search is rather demanding on the consumer's cognitive capabilities, combinations of sequential and simultaneous searches are likely to prevail. We term such search processes iterative. Theoretically, pure simultaneous search should be the most efficient search process and sequential search the least efficient. However, simultaneous search tends to require more expertise than the average consumer has. We believe that iterative search combines realistically the best combination of cognitive effort and efficiency:

H7: Iterative search is related to purchase satisfaction.

3 Data and Analysis

3.1 Survey Data

A questionnaire was sent to the random sample of size 2000 representing the Finnish population (over 18-year old). The questionnaire was pre-tested with two groups: experts and consumers from different age and demographics. The pre-test was carried out with 27 subjects. The questionnaire was revised accordingly.

The questionnaire was returned by 639 respondents. Thus, the response rate was 32 %. To study how well our final sample represents the Finnish population, we compared demographic variables of the sample to the corresponding variables in the latest census figures (from year 2004) for the Finnish population. The results are given in Table 4.

Our sample consists of more males (58.1%) and less females (41.9 %) than in the population. Because the questions concerning the use of internet had a dominant role in questionnaire, a plausible explanation is that males are known to use more internet than females. More educated people have been more active to respond to our questionnaire as well as the people with high income. We conclude that our sample represents the population of Finnish people familiar with internet accurately enough for our purposes.

Table 4: Comparing Demographic Variables in the Sample and the Finnish Population

		Frequency	Sample Percentage	Population Percentage*
Gender				
Valid	Male	351	58.1	48.8
	Female	253	41.9	51.2
Total **		604		
Education				
Valid	Comprehensive school education	127	21.3	41.5
	Upper secondary general education	50	8.4	22.9
	Vocational and professional education	159	26.7	12.7
	Polytechnic education	163	27.4	12.6
	University education	96	16.1	10.3
Total		595		
Income	Euro /Year			
	3000 – 9999	71	12.9	28.4
	10000 – 24999	147	26.7	39.1
	25000 – 49999	191	34.7	24.7
	50000 – 80000	141	25.6	5.1
Total		550		*** 97.3

  * Statistics Finland (2004)

 ** The total number of observations (639) differs from "Total" in the Table

*** The salary range in the sample covers no whole salary range in the population

Because we were interested in the consumers who had some experience on internet use and have made at least one over-night journey within past five years, we extracted a sub-sample of size 359 from the sample for further research questions.

3.2 Method

Our purpose is to find the determinants explaining the post-consumption satisfaction of online travel purchase. Satisfaction is measured by two variables: satisfied with the price of the purchase and satisfied with the quality of the purchase. Both variables were evaluated by the subjects on a 1-7 scale. The frequency distribution of the variables was very skew, because most subjects were very satisfied with their purchase (Quality and Price). That's why we re-coded the variables in such a way that the class consisting of values 6 and 7 was called "Satisfied with Quality (Price)" and the class with values 1-4 was called "Dissatisfied with Quality (Price)". Thus we have four classes.

SATISFIED WITH QUALITY, BUT NOT PRICE **n=33**	**SATISFIED WITH BOTH** **n= 260**
DISSATISFIED WITH BOTH **n=33**	**SATISFIED WITH PRICE, BUT NOT QUALITY** **n=33**

Figure 3: The Satisfaction Classes

The first group, *Dissatisfied with Both (n=33)* consists of those subjects, who were not satisfied with neither the quality nor the price of the purchase. They have bought a journey, which was not suitable for them at all. The second group *(n=33)* consists of the subjects, who were *"Satisfied with the Price, but not Quality"*. The third group *(n=33)*, includes respondents who were *"Satisfied with the Quality, but not Price"*. The subjects *"Dissatisfied with Both"* were classified to the fourth group *(n=260)*.

Our aim is to study which of our research hypotheses H1-7 are supported by our survey data. There are one or several underlying quantitative variables behind each hypothesis (see, Appendix). The total number of variables is 17 (Table 5). A problem is to find the most essential variables from among those 17 variables having influence on the satisfaction of the purchase (quality and price). When those variables are found, we may conclude which of the research hypotheses are supported. As a method we use the univariate and multivariate analysis of variance.

4 Findings

4.1 Multivariate Test for Potential Independent Variables

First, we check whether those 17 variables together consists of significant discriminating information on the differences of four group means. For this purpose, we use Wilks' lambda as a test statistic to test the multivariate hypothesis:

$$H_0: \mu_1 = \ldots = \mu_4 \text{ given } \Sigma_1 = \ldots = \Sigma_4, \tag{1}$$

where vector μ_i, $i = 1,2,3,4$, refers to the population group means in the 17 dimensional space, and Σ_i, $i = 1,2,3,4$ refers to the covariance matrix of group i. Wilks' lambda computed from the sample is 0.6961. If there are no significant differences between group means, $\Lambda \sim 1$. Note that always $\Lambda \leq 1$. To study, whether $\Lambda \sim 1$, we use the F-approximation (see, e.g. Rao (1973, p. 556)). From the sample we get F-value = 2.56 > F(0.01, 51, 1010) = 1.54. Thus we conclude that $\Lambda < 1$, and further $\mu_i \neq \mu_j$ for some $i \neq j$ at risk level less than 1%.

4.2 Univariate F-Tests for Potential Independent Variables

In Table 5, we have carried out the univariate F-tests for each variable. The results provide us with some hints that not all 17 variables are needed to provide essential discriminating information.

Table 5: Univariate F-Statistic

Variable	Total Standard Deviation	Pooled Standard Deviation	Between Standard Deviation	F Value	$P\{F(3,355) >$ F-Value$\}$
Product Class Knowledge (PCK)	2.342	2.342	0.243	0.970	0.408
Time Constraints (TC)	1.950	1.947	0.239	1.350	0.258
Involvement: Importance (INV_I)	1.946	1.912	0.463	5.260	0.002
Involvement: Price (INV_P)	1.972	1.901	0.638	10.100	<.0001
Attitude: I	1.611	1.611	0.164	0.930	0.424
Attitude: II	1.603	1.600	0.203	1.450	0.228
Attitude: III	1.705	1.704	0.191	1.130	0.339
Search Amount: Sellers (SA_S)	1.324	1.324	0.143	1.050	0.373
Search Amount: Alternatives (SA_A)	4.033	4.042	0.291	0.470	0.706
Search Amount: Time (SA_T)	5.326	5.344	0.243	0.190	0.906
Search Process: Sequential (SP_S)	0.492	0.489	0.083	2.580	0.054
Search Process: Parallel (SP_P)	0.388	0.389	0.018	0.200	0.898
Search Process: Iterative (SP_I)	0.491	0.486	0.095	3.440	0.017
Knowledge Uncertainty (KU)	1.613	1.612	0.184	1.160	0.323
Evaluation Uncertainty (EU)	1.184	1.151	0.339	7.790	<.0001
Choice Uncertainty (CU)	1.262	1.219	0.400	9.670	<.0001
Implementation Uncertainty (IU)	1.495	1.452	0.439	8.210	<.0001

4.3 Selection of Relevant Independent Variables

For further analysis, we initially pick from Table 5 the variables for which F-Value > F(0.05, 3,355) = 2.63 (risk level α = 5%). Those variables are *Involvement: Importance* (INV_I), *Involvement: Price* (INV_P), *Search Process: Iterative* (SP_I), *Evaluation Uncertainty* (EU), *Choice Uncertainty* (CU), and *Implementation Uncertainty* (IU). To carry out the null hypothesis H_0 with these variables, we obtain $\Lambda = 0.755 \sim \Lambda(6, 355, 3)$, for which F-Value = 5.75 > F(0.01, 33,1017) = 1.95, and we conclude H_1: $\mu_i \neq \mu_j$ for some $i \neq j$.

To check, whether we can drop the remaining 11 variables from further analysis, we test the null hypothesis H_0 with the remaining 11 variables. We get $\Lambda = 0.901 \sim \Lambda(11, 355, 3)$, for which F-Value = 1.11 < F(0.01, 33,1017) = 1.68, and we conclude H_0. Thus there is no evidence that those remaining 11 variables include any essential discriminating information about the differences between the satisfaction classes. It means that variables INV_I, INV_P, SP_I, EU, CU, and IU sufficiently describe the mean differences in the classes.

Table 6: The Satisfaction Group Means of Variables Essentially Contributing to Discrimination

Variable	Dissatisfied with both (n=33)	Satisfied with price, not quality (n=33)	Satisfied with quality, not price (n=33)	Satisfied with both (n=260)	Total (n=359)
Involvement: Importance (INV_I) (1-7)	4.51	4.09	5.5	5.26	5.11
Involvement: Price (INV_P) (1-7)	4.36	3.33	5	3.29	3.55
Search Process: Iterative (SP_I) (0-1)	0.24	0.27	0.58	0.42	0.4
Evaluation Uncertainty (EU) (1-7)	2.79	2.48	1.94	1.89	2.03
Choice Uncertainty (CU) (1-7)	2.9	2.76	2.33	1.95	2.14
Implementation Uncertainty (IU) (1-7)	3.15	1.97	2.51	1.91	2.09

Based on the group means in Table 6, the influence of the variables on satisfaction can be characterized as follows:

Involvement: Importance. Involvement influenced purchase satisfaction as predicted: the high-involvement consumers were more satisfied than the low-involvement consumers with the travel they purchased. When consumers feel more attached to the product, they are motivated to ensure that the purchase will meet their wants. They are likely to search both more extensively and more intensively. Since involvement was clearly related to purchase satisfaction even though search effort was not, we deduce that involvement operated through intensity of search in our data.

Involvement: Price. High price relative to one's income influenced purchase satisfaction yet the form of influence was contrary to what was predicted. For the *"Satisfied with quality, not price"* group this is can be explained by normal price-quality correlation: high quality travels tend to be relatively more expensive. The *"Dissatisfied with both"* group, however, exhibits market failure. These consumers evidently badly misjudged the travel they bought. While the price-search effort relationship is theoretically strong (Stigler 1961), it has received irregular empirical support. Neither absolute nor relative price of the product have been consistently found to determine the effort put into search or the outcome of search (Schmidt and Spreng 1996). Our data suggest that while price relative to one's income may not consistently determine the search effort, it is far from being unimportant as a determinant of consumer behavior. Taken together, the involvement hypothesis (H3) received partial support: High involvement leads to satisfaction, with qualifications.

Search Process: Iterative. The search process hypothesis (H7) was supported: Iterative search was the only search process type that influenced purchase satisfaction. Iterative search process combines stages of sequential and simultaneous search. The sequential steps are often needed and used for construction of the problem rather than for solving it. Our observation is in line with the relatively recent view of pre-purchase search being a mainly learning process in which the consumer gets educated about his/her preferences (Bettman, Luce et al. 1998).

Evaluation Uncertainty. Evaluation uncertainty influenced purchase satisfaction as predicted. High pre-purchase evaluation uncertainty affected purchase satisfaction. Evaluation uncertainty comprises doubts about one's ability to evaluate products. It is connected to incomplete product class knowledge, indecision about the product qualities that determine the eventual performance of the product. In the current context, doubts about the influence of the hotel's location on the travel experience serve as an example of evaluation uncertainty.

Choice Uncertainty. Choice uncertainty influenced purchase satisfaction as predicted. High pre-purchase choice uncertainty affected purchase satisfaction. Uncertain consumers are unsure about the ranking of the choice alternatives. One prominent reason for choice uncertainty is incomparable choice alternatives. If the alternatives do not share their salient characteristics there is no obvious ranking for them even if the preferences are known. It is doubtful if choice uncertainties can be effectively cured unless the industry agreed on a comprehensive ontology of product description on which the shopping aids can be built on.

Implementation Uncertainty. Implementation uncertainty influenced purchase satisfaction with qualifications. Its impact was most pronounced for the *"Dissatisfied with both"* group. It was second highest in the *"Satisfied with quality, not price"* group: It seems probable that these consumers "bought" themselves some assurance. Taken together, the uncertainty measures support the uncertainty hypothesis (H6) with a qualification: Knowledge

uncertainty did not influence purchase satisfaction. We interpret this as a sign of electronic markets providing sufficient product attribute information.

5   Discussion

Taken together, our analysis provide support for the hypotheses H3 (involvement), H6 (uncertainty), and H7 (iterative search). Our observations suggest that of the classic determinants of the search effort studies only purchase involvement was related to purchase satisfaction. Those consumers who found the product personally more important were likelier to do good job with searching for and choosing a pleasing product. It is also interesting to note that neither unvariate nor multivariate tests have provided us any evidence for the variables excluded from the final analysis containing any information towards explaining purchase satisfaction.

The observation about iterative search process being related to purchase satisfaction with the product is in line with observations about the effects of pre-purchase uncertainties. While iterative search is, at least in theory, less efficient than purely simultaneous search, it has the advantage of "educating" consumers about their preferences. This is close to the approach of Keeney and Raiffa (1976, p. vii) who advocate for decision analysis, "a prescriptive approach designed for normally intelligent people who want to think hard and systematically about some important real problems."

Our observations suggest that uncertainty felt prior to the purchase process still remains a strong determinant of purchase satisfaction. Uncertainties related to evaluating and choosing products, in particular, affected the experienced satisfaction. We interpret this finding to suggest that those consumers who were uncertain about their preferences before the purchase process remained relatively ill informed up to and past the purchase decision, which resulted in purchase dissatisfaction. Thus, despite all the progress we have made so far, further research in developing decision aids for the consumers is in need.

The exception to the rule is knowledge uncertainty. Apparently the current electronic markets have advanced past the stage where access to product information has ceased to be a problem. Taken together, the pattern of uncertainty influences on consumer satisfaction suggests that the amount of product information available to consumers exceeds the processing capacity rather than falls short of providing an adequate basis for informed purchase decision. Thus, need for effective tools of evaluation, such as recommendation aids or intelligent agents, appears to be in the rise.

6   Conclusions

Consumers that are satisfied with quality of travel used most often iterative search. It seems that iterative search process leads consumers to satisfied purchase. With Iterative search process i.e. "Search with recall" consumers are able to search long enough to be sure they have found the best alternative. This means that we should develop the search agents to help consumers do iterations while searching information from different sources. Nowadays most search agents are made to compare price, but not quality of products. Still, it seems that the quality of product is most important characteristic for consumers when they estimate their satisfaction on purchase.

We are able to summary this studies result: consumer perceived satisfaction of travel online purchase relate more to uncertainty than the external search determinants. One explanation is: It may be more important for a consumer to feel that he knows what he is doing than to know that he is making the most optimal choice.

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8   Appendix: Survey Questions Relevant to the Study

PRODUCT CLASS KNOWLEDGE
(7 step school grade scale ranging from 4 to 10)
Please, estimate your ability to search for and compare travel services.

SEARCH EFFORT
How many brick-and-mortar travel outlets did you visit? (number)
How many Internet travel outlets did you visit? (number)
How many alternatives did you consider? (number)
How much time did you spend to the whole purchase process (search, comparison, and purchase)? (hours)

UNCERTAINTY
(1 = totally uncertain … 7 = totally certain)
Thinking back to the start of the latest purchase process,
      how certain were you about knowing the travel services offered,
      how certain were you about your purchase criteria,
      how certain were you about which alternative to choose,
      how certain were your that you would be able to buy the alternative you had chosen?

INVOLVEMENT
(1 = totally disagree … 7 = totally agree)
Buying this travel was an important purchase for me.

TYPE OF SEARCH PROCESS
(mutually exclusive dichotomies)
Which one of the following statements best describes your method of finding the travel?
      I searched for and evaluated each travel, one at a time, before turning to the next alternative.
      I used search agent or comparison shopping tool for searching for alternative travels.
      I iterated the purchase process when searching for and comparing alternatives.

SATISFACTION
(1 = totally disagree … 7 = totally agree)
I was satisfied with the quality of my chosen travel.
I was satisfied with the price of my chosen travel.

ATTITUDE TOWARDS SHOPPING ONLINE
(1 = totally disagree … 7 = totally agree)
It is a good idea to search travel information in the internet.
It is rational to search travel information in the internet.
I like to search travel information in the internet.

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