PURCHASE TIME AND USER SATISFACTION AS EFFECTED BY WEBSITE CONVENIENCE

Dr. Gerry Scheffelmaier, Middle Tennessee State University, gwscheff@mtsu.edu; Dr. John Vinsonhaler, Utah State University, jvinson@b202.usu.edu; and Dr. David Paper, Utah State University, dpaper@b202.usu.edu

ABSTRACT

The paper proposes and empirically evaluates a Web convenience theory (WCT). WCT assumes most people who actually purchase goods on the Web, are aware of product quality, variety and price, but are also time conscious and frustration prone. Websites that make finding and buying a product easy will satisfy customers and lead them to buy and return to buy again. Websites that make finding and buying a product difficult will quickly frustrate the customers and they will leave without buying and not return (13). Two predictions were made from the theory: As convenience increases (1) customer satisfaction increases and (2) the time necessary to purchase decreases. The experimental design varied convenience and product type and observed satisfaction and time. Both of the predictions were verified with statistical significance (p < .000). Theoretical and practical implications are discussed.

Keywords: I-Commerce, Web Satisfaction, B2C, Web Convenience, Web site effectiveness

INTRODUCTION

In this article, we propose a theory of web convenience based on convenience theory developed in traditional marketing. Our proposed web convenience theory (WCT) asserts that most people who actually purchase goods on the Web are aware of product quality, variety, and price, but are also time limited and frustration prone (13) (23). Their goal is to buy a product. At least for non-personal products widely purchased on the Web (low cost, low risk products), this theory predicts that (1) As Website convenience (the ease with which products can be located and purchased) increases, (2) time to purchase decreases, and (3) user satisfaction, likelihood of purchase and return to purchase, all increase.

RELEVANT RESEARCH

Importance of Web Convenience
Research suggests that Web convenience is an important determinant of user satisfaction with Websites (3) (13) (14) (16) (20) (22) (24). Web convenience was found important in the Schehr (2001) study with 75% of Web buyers felt pressed for time in their daily lives and 28% of non-Internet users agreed with the statement “because the Internet is more convenient.” Convenience was more important than price to nearly half of Web buyers and convenience is the dominant factor in consumer E-Commerce satisfaction.

Web and Product Satisfaction
The literature contains the following definitions of satisfaction: (1) Product satisfaction is the buyer’s evaluation of the product during the post purchase evaluation phase where good quality equals satisfaction and (2) Web satisfaction is the buyer’s satisfaction with the Web site on
which the buyer has purchased a product. Most studies of Web Satisfaction attempt to determine the site characteristics which are the most important to satisfaction (2) (15) (19).

**Methodology**

There appear to be relatively few experimental studies, independent variables are varied and dependent variables observed, in the literature on buyer behavior on the Web. Most research includes some form of survey questionnaire. However, the Sharma, Bearden, and Teel (1983) study built a computer program to simulate the Web, which antedates Internet commerce. The study uses the independent variables, High effort and Low effort products, and using a Catalog versus Simulated online Purchase. The authors found that (1) online - greater time pressure, (2) catalog - more comparison shopping, and (3) high effort products - higher perception of risk and adequacy of the information provided.

The design of our experiment is based on the empirical study of Nielsen, Snyder, Molich, and Farrell (2000) who evaluated procedures for studying users’ behavior on the Web. The study asked participants to complete three tasks in evaluating the sites: (1) answer questions about the purpose and usefulness of the site, (2) search for items on an assigned site, and (3) complete an open-ended task of buying an item for a general purpose, (e.g., winter clothes).

**METHODS**

**Participants**

A purposeful sample was used consisting of 108 undergraduate students attending one of three business colleges in two western states (4) (6) (10). Since college students are an important part of the Web user population this population sample seemed appropriate.

**Design**

The independent variables in the study were product type and level of Web convenience. The dependent variables were time to purchase and user satisfaction score. The basic design of the experiment is shown in Table 1. The following was completed in this experimental situation: (1) carefully controlled with an experimenter and three assistants, (2) standardized instructions given to all groups, (3) participants were randomly assigned to treatment groups, and (4) treatments were run in a random order.

Six treatment groups were used, one for each of the six sites. Sites varied by the product searched (Prescription Drugs, Music CD’s, Clothing) and the level of Web convenience (high and low). Convenience was a subjective measure of the apparent ease of locating and buying products on the site. The data collection process for “Time Needed to Purchase the Product” and “Satisfaction Rating” was identical for all groups. First, participants were asked to find and attempt to purchase a specific product on an assigned site. Second, fictitious credit card numbers were used (a rejected card was counted as a purchase). Third, times were recorded by the participant and checked by the experimenter or his assistants as follows: (1) when the site appeared in the browser (Start Time), (2) when the Product was located and placed in the Market Basket (Time to Find Product), and (3) when the actual purchase was completed (Purchase Time). Participants were run in groups of 12 in a microcomputer lab with connections to the Internet using Internet Explorer. A total of 15 minutes was allowed for finding and buying the products. Only two participants failed to find and buy the product within the time period.
Table 1 Basic Experimental Design

<table>
<thead>
<tr>
<th>Treatment Group</th>
<th>Web Site</th>
<th>N</th>
<th>Web Site Convenience</th>
<th>Product Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A</td>
<td>18</td>
<td>Low</td>
<td>Drug (Penicillin)</td>
</tr>
<tr>
<td>2</td>
<td>B</td>
<td>18</td>
<td>Low</td>
<td>Music CD (Ray Charles CD)</td>
</tr>
<tr>
<td>3</td>
<td>C</td>
<td>18</td>
<td>Low</td>
<td>Clothing (Men’s T-Shirt)</td>
</tr>
<tr>
<td>4</td>
<td>D</td>
<td>18</td>
<td>High</td>
<td>Drug (Penicillin)</td>
</tr>
<tr>
<td>5</td>
<td>E</td>
<td>18</td>
<td>High</td>
<td>Music CD (Ray Charles CD)</td>
</tr>
<tr>
<td>6</td>
<td>F</td>
<td>18</td>
<td>High</td>
<td>Clothing (Men’s T-Shirt)</td>
</tr>
</tbody>
</table>

Independent Variables

Products  Unlike Nielsen et al. (2000) specific products were chosen from product categories based on the high frequency of being purchased on the Web (5). One of the three products types as shown in Table 1 was assigned to each participant.

Website Convenience  The sites for the study were selected and categorized as follows: (1) a search was made for Web sites selling the product types, (2) two equivalent sites were chosen for each of the three products, and (3) each product was classified as either low convenience, seemed more difficult to find and buy, or high convenience, seemed easy to locate and buy. This was a subjective judgment based on several searches of each site by the authors. The actual design of this study is a “Quasi-Experimental Design” because the independent variable convenience is varied by selection rather than actual direct manipulation (1). A sixty-item rating scale of site design quality was used to verify (15). We found no significant difference in mean scores for the high and low convenience sites.

Dependent Variables

Time to Purchase  The dependent variable Time to purchase was calculated by taking the difference between the start time and the purchase time for a participant. It should be noted that we are predicting an inverse relationship between convenience and purchase time. That is, the more convenient it is to shop on a Website (higher convenience), the less time it takes (shorter the time) to purchase.

User Satisfaction  In the current study, our dependent variable is a measure of Web Satisfaction. The criterion to which our research is directed is the willingness of a Website user to buy a product and return to buy another product. While a close relationship between self-reported satisfaction, purchasing, and other customer behaviors has been postulated, it is not identical to actual purchasing behavior (3) (12) (18).

After completing the search, the participants were asked to complete the Post Search Evaluation Questionnaire. This questionnaire was used as a surrogate quality measure and included the following three items for rating the site: (1) Use Again Item: “I would or would not use this site again,” (2) Level of Frustration Item: “My level of frustration while using this site,” and (3) General evaluation Item: “General evaluation of the site.”

Specifically, SSjs (Satisfaction Score) is the sum of the ranking on the three items in the questionnaire assigned by a judge j to a given site s. The Satisfaction Score contents and procedure are adapted from the studies of Forrester Research (2000) and Nielsen et al. (2000).
Statistical Analysis
To analyze sample statistics we chose univariate Analysis of Variance (ANOVA) and multivariate Analysis of Variance (MANOVA). These statistical techniques were chosen as they matched our research model and both methods share the same assumptions (21). The observations in this study are considered to be independent when the treatment is individually administered and collection times and satisfaction ratings were performed independently for each participant (7).

According to Stevens (2002, p. 271), this test is robust against heterogeneity of variance because the treatment group sizes are equal. Our groups contained 18 participants per group. Because the dependent variables taken individually, we logically concluded that the most appropriate primary analysis (the one on which the research hypothesis is decided) would be to perform two univariate ANOVA’s, one on each of the dependent variables – *time to purchase* and *satisfaction* (8).

RESULTS

Satisfaction Score
The relationships among the independent variables (product type and level of convenience) and the dependent variable (satisfaction) are displayed in Figure 1. The effect of convenience is shown by the upward slope of the lines for all product types. The effects of products are shown by the vertical difference between the lines for products. A possible interaction for drugs is indicated by the relatively lower satisfaction mean score for drugs at a low level of convenience.

Figure 1 Relationship Among Convenience, Products and Satisfaction

The results for the ANOVA indicate the main effect for convenience was significant at the .01 level, with a probability of less than .001, indicating that convenience has a significant association with satisfaction. The main effect for product, .019, and the interaction between product and convenience, .0127, was not significant at the .01 level of confidence. Thus, type of product appears to have no significant association with Satisfaction.
Time to Purchase
The results confirm the prediction that sites with higher convenience yield lower times to purchase. The relationship among the independent and dependent variables is depicted in Figure 2. The significant effects of convenience on time are shown by the slope of the lines down from low to high convenience.

The results of the ANOVA for Time to Purchase indicate that the main effect for product type was significant at the .01 level of confidence with a probability of .001, so the mean times for Products are significantly and take longer to purchase. The main effect of convenience is again significant at the .01 level of confidence, having a probability less than .000. Finally, the interaction effect between product and convenience was not significant at the .01 level of confidence, having a probability of .016.

Figure 2. Relationship between Convenience and Mean Time to Purchase

Research frequently reports MANOVA results to verify the findings of multiple ANOVA’s. The MANOVA tables are not reported since the results are identical to those of the two ANOVA’s reported in this study with the F-test values and the probabilities being identical.

CONCLUSIONS
This article reports an exploratory study using a Theory of Web Convenience as a theoretical lens and asserts that customers who buy on the Web are convenience-oriented (finding and buying a product easy and fast) thus, satisfying their customers. Difficult Websites will quickly frustrate their customers who will then leave without buying and not return. The following two predictions were made from the theory: (1) as convenience increases, satisfaction increases and (2) given that the first prediction holds, time necessary to purchase decreases. Both predictions were verified in this experiment, with highly significant effects (p < .000).

The convenience-product interaction finding was not significant at our stringent alpha level, but would have been at a more commonly tested level. However, we believe that this finding is important to clarify part of the nature of Web convenience. However, in the drug case it was discovered that a good Web site design can be frustrating if participants are required to complete a lengthy personal questionnaire prior to finding and purchasing the product.
Limitations
One problem with our results is that they are based on a measure of satisfaction, not on actual purchase behavior, including visitor to buyer and buyer to repeat buyer conversion rates. The difficulty is that conversion rates and other important data on the success of Web sites are under the control of the companies developing or researching the sites. Perhaps easier access to databases, such as the Wharton Database (9), could solve this problem.

A problem with our construct of Web convenience is its subjective nature. To marginalize this problem, we propose to operationally redefine Web convenience as *apriori* time to purchase. That is, for any given study, we suggest the researcher run a selection of *apriori* searches on Web sites for whatever products are tested in the study, and use the mean time required to purchase as an operational definition of Web convenience.

Future Research
The findings offer important theoretical lessons. First, convenience theory can be adapted for use in Web research. Second, such theory can predict customer satisfaction (within the context of time) for Web shopping. Finally, convenience theory offers a logical framework to guide future Web research studies.

Our suggestions for future research are as follows. First, a methodological replication of this study should be attempted with a different population of Web users. We are currently collecting data for a replication with an older retired population. Second, a similar study should be run using a broader range of products including high cost, high risk and personal products, which theoretically should be less effected by convenience. Third, a direct manipulation of Web convenience should be attempted. This study should manipulate the placement of the customer registration page, the presence or absence of a product search engine, and the complexity of the process of searching and buying. Finally, better access to sales data for commercial web sites could make all of our research more valid and more applicable in the business world.

Value to Practitioners
If these results are replicable, they offer important lessons for the Web executive. First, Website convenience (the degree to which products are easy to locate and purchase) is important to user satisfaction. Second, a simple practical measure of convenience is the average time it takes for a customer to locate and purchase a product. These data are probably available in most Websites and could be used to evaluate or improve an existing site. Third, convenience is determined by the design of the site. Placing impediments to locating and purchasing products (such as requiring user registration at the beginning of the purchase process) can have a critical effect on convenience and satisfaction, even for an otherwise well-designed site.

REFERENCES


