

## **EXAMINING THE RELATIONSHIP BETWEEN DEMOGRAPHICS AND THE FREQUENCY OF ONLINE PURCHASING**

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### **ABSTRACT**

Understanding demographic buyer profiles can play a key role in increasing the success of e-tailing, as it will allow online retailers to be in a better position to market their products and services in those geographic segments that have the most appeal. In this study, we use a survey instrument to examine the association between Internet usage activity and the following demographic variables: gender, age, income, education, and ethnic background. In addition, we examine the impact of speed of Internet connection and Internet experience on Internet usage activity. Using the chi-square test of independence, our results reveal that education, income, and speed of Internet connection are all associated with frequency of online shopping. In specific, higher levels of education and income, and faster Internet connections appear to be related to higher frequencies of online purchases.

**KEYWORDS:** demographics, online shopping

### **INTRODUCTION**

The volume of online business-to-consumer (B2C) transactions continues to rise despite the recent failures of several dot-com companies. Recent statistics compiled by the Census Bureau of the department of commerce estimate that U.S. retail e-commerce sales for the fourth quarter of 2003, not adjusted for seasonal and holiday differences, were \$17.2 billion, an increase of 25.1 percent from the fourth quarter of 2002.

Using the Internet as a viable marketing channel poses various challenges. Online fraud, reduced opportunity for sensory shopping, the postponement of consumption or enjoyment of tangible products until physical delivery, poor design interface, privacy concerns, limited product selection, and lack of face-to-face interactions with salespeople are some of the challenges that are often cited in the literature as obstacles to e-tailing. However, Teo (2001) argues that it is also vital to understand the demographic and motivation factors that are associated with Internet usage. Similarly, Harrison-Walker (2002, page 12) contends that "Before an organization decides to serve the global web

community, it must examine the proportion of Internet users in its selected geographic markets and the projected growth in Internet usage, as well as user demographic and buying profiles.”

Using a survey instrument, the aim of this study is to empirically examine the relationship between various demographic variables and Internet usage activity. Understanding demographic buyer profiles can play a key role in increasing the success of e-tailing, as it will allow online retailers to be in a better position to market their products and services in those geographic segments that have the most appeal.

## **RESEARCH OBJECTIVES**

In this study, we examine the association between Internet usage activity and the following demographic variables: gender, age, income, education, and ethnic background. In addition, we examine the impact of speed of Internet connection and Internet experience on Internet usage activity. The variable “Internet usage activity” is measured by the frequency of online purchases made in the last 6 months. A five-point ordinal scale is used to measure the frequency of online purchases using the following anchors: none, 1 to 3 purchases, 4 to 6 purchases, 7 to 9 purchases, and more than 10 purchases. The next section provides a brief description of the demographic variables, along with the hypotheses that are tested in this study.

### **Gender**

Various studies have demonstrated that Internet users are predominantly males (Korgaonkar and Wolin, 2002). A recent report by Pew Internet & American Life Project (2003) cites that in August 2003, 65% of men were online compared to 61% of women. However, high proportions of females were involved in seeking health or religious information on the web, while a large percentage of males sought news, financial information, sports news, and political news. Therefore, we test the following set of hypotheses:

$H_0$ : Frequency of online purchases is not related to gender.

$H_a$ : Frequency of online purchases is related to gender.

### **Age**

According to a survey by Ernst & Young, adults 60 years of age and older are the least likely to make spontaneous purchases online (Pastore, 2000). The survey also found that when it comes to age groups, more young people buy CDs and videos online, while 88% of people under the age of 25 have made an unplanned purchase. In this study, we test the following set of hypotheses:

$H_0$ : Frequency of online purchases is not related to age.

$H_a$ : Frequency of online purchases is related to age.

## **Income**

Harrison-Walker (2002, page 12) states that “Income impacts discretionary income, while literacy affects comprehension of marketing communications.” Thus, one expects that as income goes up, so too the number of online purchases. Accordingly, the following hypotheses are tested:

$H_0$ : Frequency of online purchases is not related to income.

$H_a$ : Frequency of online purchases is related to income.

## **Education**

Many consumers resist buying online due to concerns about security and privacy issues. However, as education level increases, one expects such concerns to lessen to some degree, thereby impacting the frequency of online purchases. This notion is supported by Teo (2001, page 128) who contends that “higher education level may result in greater knowledge about computers, thereby facilitating Internet usage.” Anderson and Bickson (1995) add that educated consumers have higher access to the web as well as to personal computers at home, work, or school compared to less educated consumers. In view of that, we test the following hypotheses:

$H_0$ : Frequency of online purchases is not related to education.

$H_a$ : Frequency of online purchases is related to education.

## **Ethnic Background**

A report by Pew Internet & American Life Project (2003) cites that although Internet adoption has increased in all demographic groups, there are still specific gaps in Internet use along several demographic profiles. In specific, the report states that minorities are less connected than whites. Consequently, we test the following set of hypotheses:

$H_0$ : Frequency of online purchases is not related to ethnic background.

$H_a$ : Frequency of online shopping is related to ethnic background.

## **Speed of Internet Connection**

A recent report in BusinessWeek (March 1, 2004) states that although broadband is available to 89% of all U.S. households, only 18% subscribe. A “broadband user” is an Internet user who has a high-speed DSL, cable, wireless, T-1, or fiber optic connection. In this study, we test the proposition that Internet users who have high-speed connections are more likely to purchase products and services online than those with dial-up connections. The rationale behind this proposition stems from the likelihood that Internet users with dial-up connections may have a higher probability of abandoning their shopping carts due to frustrations related to sluggishness of their communication channels. Accordingly, we test the following set of hypotheses:

$H_o$ : Frequency of online purchases is not related to speed of Internet connection.

$H_a$ : Frequency of online purchases is related to speed of Internet connection.

### **Internet Experience**

Sexton, Johnson, and Hignite (2002) report that e-commerce consumers with more than three years of online experience were found to be almost twice as likely to make online purchases as those with limited Internet experience. Hoffman, Novak, and Peralta (1999) also found that concerns over functional barriers to shopping online decrease as Internet experience increases. In view of that, we test the following set of hypotheses:

$H_o$ : Frequency of online purchases is not related to Internet experience.

$H_a$ : Frequency of online purchases is related to Internet experience.

### **METHODOLOGY**

Our sample consisted of Internet buyers defined as those who are engaged in buying products and services online. The national random sample listing, consisting of opt-in emails, was obtained from Martin Worldwide ([www.MartinWorldwide.net](http://www.MartinWorldwide.net)), a provider for direct mail and telemarketing leads. The link to the web survey was sent via e-mail to 6666 Internet buyers. The questionnaire consisted of three sections. The first section dealt with gathering background variables that pertained to gender, age, education level, income, Internet experience, ethnic background, type of Internet connection, and frequency of shopping online. The second section consisted of various statements designed to gauge online consumers' perceptions about e-quality factors related to online retailing. The third section pertained to ranking the top three e-quality factors that are organized along four phases of an online shopping experience: (1) encountering the online retailer's homepage; (2) selecting a product from the online catalog; (3) completing the order form; and (4) accessing customer service and support. Since only the first section of the survey is pertinent to our research objectives, results from the other two sections are not discussed. To increase our response rate, cash prizes were provided to four randomly selected respondents.

### **RESULTS**

#### **Respondent Profile**

A total of 422 completed the online survey, yielding about 6.3% response rate. Of those responding, 23.13 % indicate that they had made at least 10 online purchases in the last 6 months, while the largest percentage (31.08%) had made one to three online purchases during the same period (see Figure 1). In terms of age, the average age is 44 years, with the largest percentage (30.05%) being between 40 to 50 years old. With regard to gender, 58.55% of the respondents are female. The majority of respondents are Caucasians (72.97%), while Hispanics constitute the smallest ethnic group (4.55%) (see Figure 2).

Furthermore, as illustrated in Figure 3, the distribution of annual household income is fairly symmetric, with the highest percentage earning less than \$30,000. In terms of the highest level of education completed, the majority of respondents (35.08%) had some college, followed by bachelor's degree (22.67%), high school diploma (17.42%), advanced degree (12.41%), associate degree (10.74%), and some high school (1.67%) (see Figure 4).

Respondents were asked to indicate the type of Internet connection used for purchasing online. While 40.47 % of the respondents use 56K dial-up connection, 46.8% report using a broadband connection (i.e., DSL, cable, or T1 line) (see Figure 5). Finally when respondents were asked to indicate how long they have been using the Internet, the highest percentage (77.09%) responded over 4 years (see Figure 6).

### **Hypotheses Findings**

To test the association between the demographic variables and the frequency of online purchases, the chi-square test of independence is used. The results demonstrate that gender and frequency of online shopping are independent of each other ( $p=0.124$ ). In testing the independence between age and frequency of online shopping, the variable age was grouped into 4 categories (less than or equal to 30 years, 31 to 40 years, 41 to 50 years, and over 50 years) to ensure a minimum of 5 observed frequencies per cell. The results reveal that age and frequency of online shopping are not associated with each other ( $p=0.999$ ). At the 0.01 level of significance, income and frequency of online shopping were *not* independent of each other ( $p=0.000$ ). The results indicate that higher income levels are associated with more frequent online shopping. At the 0.01 level of significance, the results further reveal that education level and frequency of online shopping are *not* independent of each other ( $p=0.005$ ). Higher levels of education are associated with higher frequency of online shopping. To test for an association between ethnicity and frequency of online shopping, the variable "ethnic background" was collapsed into two categories: Caucasian and non-Caucasian. The results showed that ethnicity was independent of the frequency of online shopping ( $p=0.286$ ). At the 0.05 level of significance, the speed of Internet connection was *not* independent of the frequency of online shopping ( $p=0.010$ ). The results demonstrate that higher frequency of online shopping is associated with "broadband" connections. Finally, our results reveal that Internet experience and frequency of online shopping are independent of each other ( $p=0.324$ ).

### **CONCLUDING REMARKS**

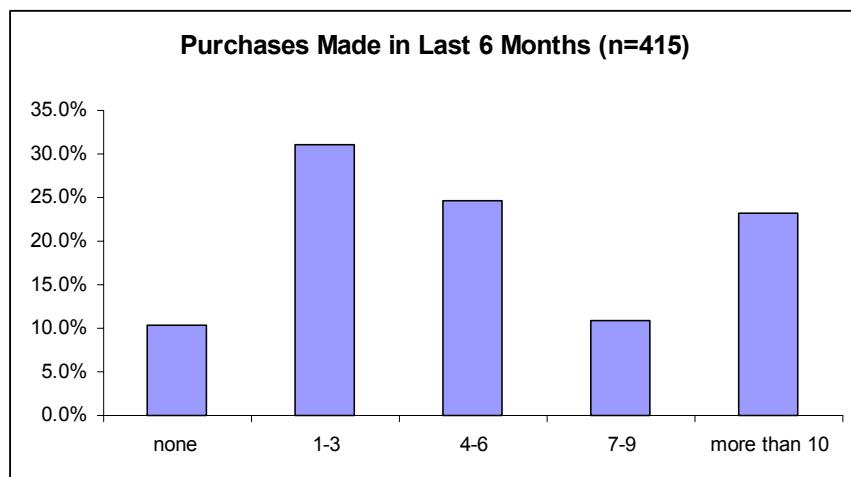
While web design and security issues continue to play a critical role in shaping the success of online retailing, understanding the demographic profiles of Internet users is equally important for deploying an effective e-strategy. In this study, we examine the association between frequency of online purchases and the following variables: gender, age, income, education, ethnic background, speed of Internet connection, and Internet experience.

Using the chi-square test of independence, our results reveal that education, income, and speed of Internet connection are all associated with frequency of online shopping. In specific, higher levels of education and income, and faster Internet connections appear to be related to higher frequencies of online purchases. Such results can be especially important to e-tailers in developing effective marketing strategies that target online buyers with specific demographic profiles. Our results should also prove to be beneficial to researchers in developing structural models that link the success of e-tailers to demographic and non-demographic critical success factors.

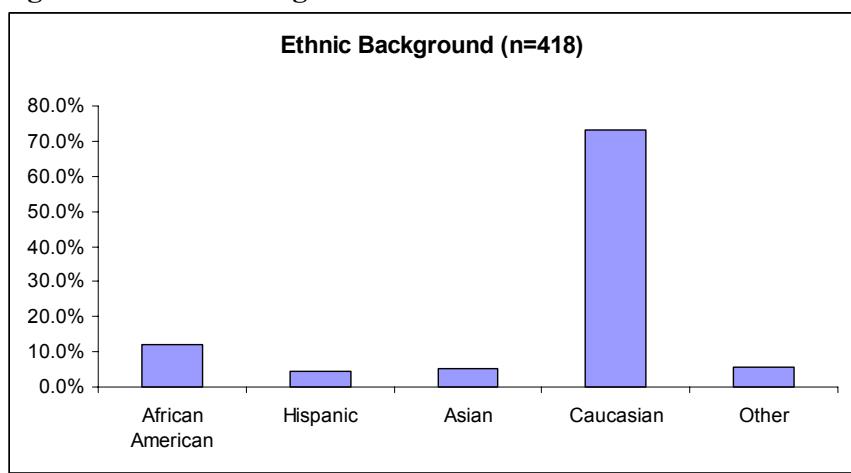
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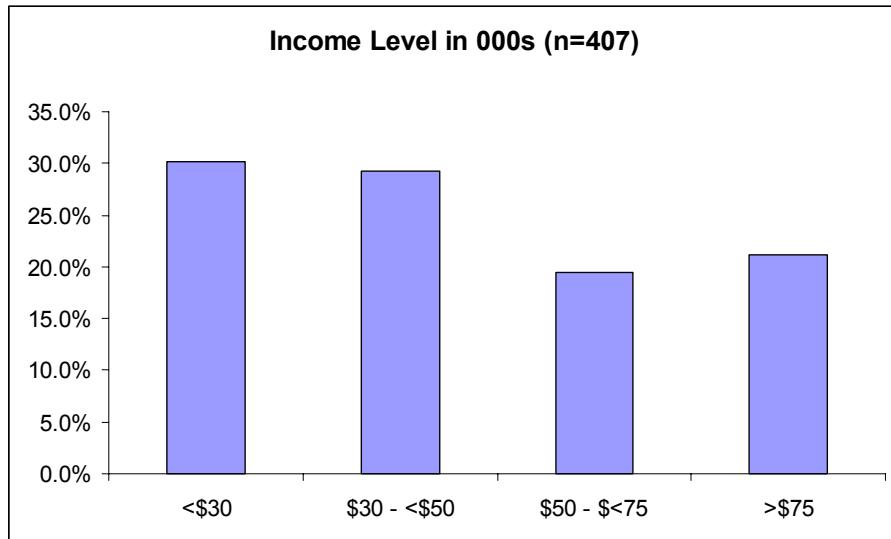
**Figure 1: Number of Online Purchases Made in the Last 6 Months**



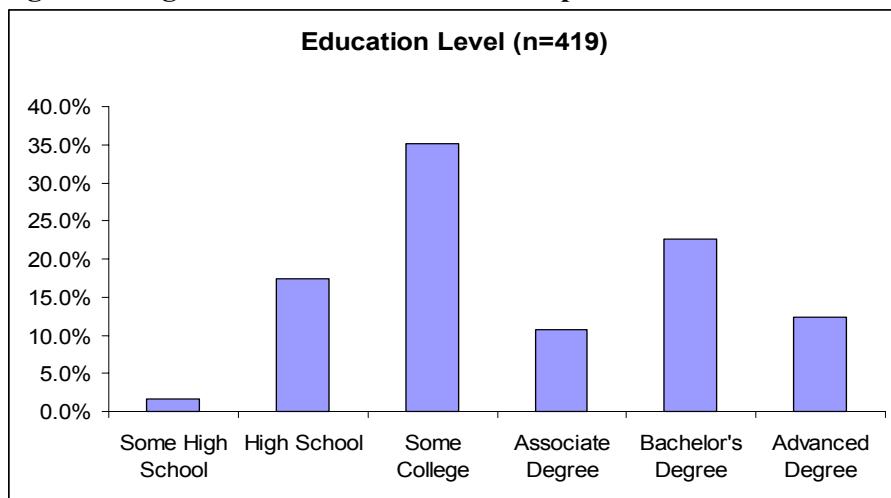
**Figure 2: Ethnic Background**



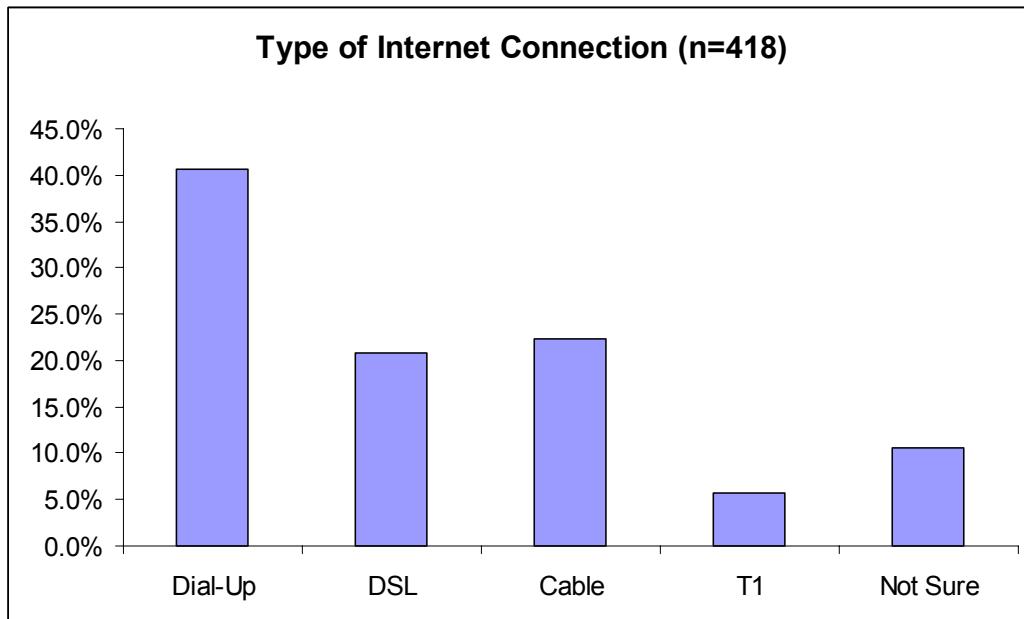
**Figure 3: Annual Household Income Level**



**Figure 4: Highest Level of Education Completed**



**Figure 5: Type of Internet Connection Used for Purchasing Online**



**Figure 6: Number of Years Using the Internet**

