

Differences in Internet Users' Online Activities: The Influence of Their Characteristics on What They Do Online

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According to the UCLA Center for Communication Policy (2003), over 70% of Americans used the Internet in 2003. Compared to just a few years ago, the variety of transactions that consumers can complete online has increased. Consumers are shopping, buying, banking, trading, and complaining online as well as acquiring information online to help them make off-line decisions about everything from health care to how to cast their votes in the next election. Information-seeking online activities have increased in prevalence since the year 2000. In addition, financial and transaction-based activities have grown more than any other type of online pursuit (Madden & Rainie, 2003).

One of the questions that marketers as well as academic researchers have investigated is *who* is going online. While several studies (see, for example, Bhatnagar, Misra, & Rao, 2000; Boneva, Kraut, & Frohlich, 2001; Howard, Rainie, & Jones, 2001; Jackson, Ervin, Gardner, & Schmitt, 2001; Korgaonkar & Wolin, 1999; Sheehan, 1999; Trocchia & Janda, 2000) have demonstrated a relationship between online behaviors and demographic characteristics, others (see, for example, Goldsmith & Goldsmith, 2002; Huang, 1998; Lohse, Bellman, & Johnson, 2000; Miyazaki & Fernandez, 2001) have suggested that one's online characteristics (such as experience) are important in explaining differences in online behaviors.

The purpose of this study was to further explain differences in online transactions among people with different demographic characteristics and different experiences with the Internet. The study has two main objectives. The first is to describe the characteristics of current Internet users. The second objective, which is the central one, is to determine whether there is a statistically significant relationship between different types of Internet users' online activities (shopping, financial transactions, and auctions) and the users' gender, race, age, income, and educational level, their experience with the Internet, where they access the Internet, and how connected users feel to the Internet.

Shopping online was one of the three transaction activities selected because it is among the five most popular Internet activities (UCLA Center on Communication Policy, 2003). The other two transactions were selected because of their rapid increase in popularity. Financial transactions were among the fastest growing online activities since 2000; the number of participants in online auctions has almost doubled since 2000 (Horrigan & Rainie, 2002).

Method

Based on the literature review, a model was developed that proposes that participation in online transaction activities is influenced by both demographic characteristics (income, education, gender, age, and race) and online characteristics (the location from which the user connected to the Internet, experience online, and connectedness to the Internet). Online shopping was defined as ever having bought a product online, including travel reservations. Online financial transactions were defined as ever having done any banking online or ever having bought or sold stocks, mutual funds, or bonds online. Online auctions were defined as ever having participated in an online auction. Each of the transaction variables was coded Yes (1) or No (2).

The descriptions of the independent variables and how they were measured are reported in Table 1. Most of the variable descriptions are self-explanatory. However, explanations of the variables "experience" and "Internet connectedness" may be useful. The literature has traditionally measured experience as either how frequently the

user goes online or the period of time since the user first went online. The latter measure was the one available in the data set used in this research.

Table 1
Independent Variables and Their Measurements.

Independent Variables	Measurement
Annual household income	Less than \$20,000, \$20,001-\$40,000, \$40,001-\$75,000, above \$75,000
Educational level	Less than high school, high school graduate, some college education, college and above
Gender	Male (1) or female (2)
Age	Continuous from 18 to 99
Race	Dummy variables: White, black, Asian (coded 0), and other
Internet access location	Dummies: Home only (0), work only, both home and work, neither home nor work
Experience online	Last six months, one year, two or three years, more than three years
Internet connectedness	Created by summing values for two variables: How much one would miss going online if one could no longer (a lot, some, not much, or not at all) and how much one would miss e-mail (a lot, some, not much, or not at all)

The variable “Internet connectedness” is our measure of what Bellman, Lohse, and Johnson (1999) described as a “wired” lifestyle. The two measures available in the data set that related to Internet connectedness were how much one would miss going online and e-mail if they were unavailable. For this study, a variable was created that combined the two measures, giving each equal weight.

The hypothesized relationships are summarized in Table 2. Income and education were hypothesized to be positively related to all three types of transactions. The hypothesized relationships for the other independent variables followed the literature. A plus (negative) sign in Table 2 indicates a positive (negative) relationship was hypothesized. No sign indicates that neither the literature specific to that transaction nor the diffusion of innovations literature suggested the direction of the relationship and it was hypothesized in the null form.

Logistic regression analysis (Vogt, 1998) was used to test the hypotheses. The proposed regression equation was:

$$Y = \alpha + \beta_1x_1 + \beta_2x_2 + \beta_3x_3 + \beta_4x_4 + \beta_{5w}x_{5w} + \beta_{5b}x_{5b} + \beta_{5o}x_{5o} + \beta_{6w}x_{6w} + \beta_{6hw}x_{6hw} + \beta_{6n}x_{6n} + \beta_7x_7 + \beta_8x_8 + \varepsilon \quad (1)$$

The model was run three times. The dependent variables were the respondents’ online transactional activities. In the first model, Y was the measure of online shopping and H1 and H2 were tested. In the second run, Y was online financial transactions and H3 and H4 were tested. The third time Y was online auctions and H5 and H6 were tested.

The demographic characteristics in the equation were: x_1 = income; x_2 = education; x_3 = gender (omitted = males); x_4 = age; x_5 = race (omitted = Asian, x_{5w} = white, x_{5b} = black; and x_{5o} = other). The online characteristics in the equation were: x_6 = access location (omitted = access from home; x_{6w} = access from work; x_{6hw} = access from both home and work, and x_{6n} = access from neither home or work); x_7 = experience with the Internet; x_8 = connectedness to the Internet. The error score was represented by ε in (1).

The data for this study were from a survey conducted by Princeton Survey Research Associates (2001) in March 2000. Simple random sampling was the sampling plan. The 3,583 adult respondents (18 years old and above) were selected by random digit dialing.

Compared with all Internet users, online shoppers had higher incomes and education, were more likely to be white, were more likely to access the Internet from both home and work, and were more experienced with and felt more connected to the Internet.

The model was statistically significant in predicting the log odds of adoption of online shopping. Analysis of the Wald chi-square for each independent variable indicated that eight independent variables were significantly related to respondents' adopting online shopping. A further investigation of the coefficients revealed the direction

and size of the relationship between each of the significant independent variables and respondents' use of online shopping.

Among the demographic characteristics, annual income and education were positively related to online shopping while the relationship to age was negative. While the income and education relationships were as hypothesized, Asian-Americans were not more likely than all other races to shop online. In addition, being black

Table 2
Summary of Hypotheses Tested.

Dependent Variable	Hypotheses	Outcome
Online shopping	H1a: Income (+)	Supported
	H1b: Education (+)	Supported
	H1c: Gender (female -)	Not supported
	H1d: Age (+)	Not supported (-)
	H1e: Race (Asian +)	Partially supported
	H2a: Access location	Not supported
	H2b: Internet experience (+)	Supported
	H2c: Internet connectedness (+)	Supported
Online financial transactions	H3a: Income (+)	Supported
	H3b: Education (+)	Supported
	H3c: Gender (male +)	Not supported
	H3d: Age (-)	Supported
	H3e: Race (Asian +)	Partially supported
	H4a: Access location	Partially supported
	H4b: Internet experience	Not supported (+)
	H4c: Internet connectedness	Not supported (+)
Online auctions	H5a: Income (+)	Not supported
	H5b: Education (+)	Not supported (-)
	H5c: Gender (male +)	Supported
	H5d: Age (+)	Not supported (-)
	H5e: Race	Supported
	H6a: Access location (home +)	Partially supported
	H6b: Internet experience (+)	Supported
	H6c: Internet connectedness (+)	Supported

compared to being Asian was negatively related to online shopping. The hypothesis that women were less likely to shop online than men was not confirmed.

Among the online characteristics, going online from work only compared to from home only was negatively related to online shopping, contrary to the hypothesis that there would be no relationship to access location. In addition, going online from both home and work as compared to from home only was positively related to online shopping. As expected, both experience online and Internet connectedness were positively related to online shopping.

Compared to all Internet users, adopters of online financial services were younger, had higher incomes and education, were more likely to be male, and to be experienced with and feel connected to the Internet, and to access the Internet from both home and work. The model for online financial services was also statistically significant in predicting the log odds of adoption of online financial services.

The analysis of Wald chi-square for each independent variable found that seven independent variables were significantly related to respondents' adopting online financial services. Among the demographic characteristics, annual income and education were positively related to adoption of financial services while age and being white as compared to Asian were negatively related. The first three relationships were as anticipated; the hypothesis related

to race was that Asians would be more likely than whites to use online financial services. In addition, contrary to expectations, gender was not important in explaining use of online financial services.

Going online from both home and work as compared to from home only, online experience, and Internet connectedness were each positively related to the use of online financial services. Each of these hypotheses was stated in the null form.

Compared with all Internet users, those who participated in online auctions were younger, had higher incomes, were primarily male and white, were experienced with the Internet, felt very connected to the Internet, and went online from both home and work. They had less education than either online shoppers or users of online financial services. The model for online auctions was statistically significant in predicting the log odds of adoption of online auctions. The analysis of Wald chi-square for each independent variable found that seven independent variables were significantly related to respondents' use of online auctions. Unlike the results for the online shopping and financial services models and contrary to the hypothesis, the coefficient for education was negative in the online auctions model. As hypothesized, gender and age were also significantly related; males and younger persons had higher odds of participating in online auctions.

Going online from work only compared to from home only and going online from neither work nor home were negatively related to participating in online auctions. In contrast, both experience online and Internet connectedness were positively related to participating in online auctions. Each of these relationships was as anticipated.

Implications and Conclusions

Even when online characteristics were included in the model, demographic characteristics were important in explaining consumers' online shopping and use of financial services and online auctions. However, the relationships were not consistent across the three types of online transactions. Income and education were significantly and positively related to shopping online and using online financial services. In contrast, income was not significantly related to participation in online auctions; education was significant but the relationship was negative.

The hypothesis that males were more likely to participate in online auctions was supported. However, gender was not significantly related to online shopping or financial services as previous literature suggests. Perhaps this result is a reflection of the trend toward Internet users resembling the general population. This may be especially true of online shopping, which is more widespread than either of the other two online transactions included in this study. In addition, the only hypothesis about age that the data supported was that younger consumers were more likely to use online financial transactions.

In comparison to the demographic characteristics, the relationships between respondents' online characteristics and the three online transactions were more consistent. One implication of this result is that future researchers should include variables other than demographics in models explaining online behaviors. The inclusion of other variables will increase in importance as Internet users become even more like the general population.

Online experience and Internet connectedness were positively related to participation in all three online activities. The results, while significant, were mixed for access location; respondents accessing the Internet from both home and work were more likely to participate in online shopping and to adopt online financial services than respondents accessing the Internet from home. Respondents accessing the Internet from work only were less likely to participate in online shopping and online auctions than respondents accessing the Internet from home.

Workplace policies and/or concerns about privacy may limit the use of work computers for some personal online transactions. Which transactions, however, may depend on the workplace and the transactions. On the other hand, whether one accesses the Internet from both home and work versus other locations may simply be another measure of what Bellman, Lohse, and Johnson (1999) described as a "wired" lifestyle and the variable described here as Internet connectedness. The more integral the Internet is to completing life's important tasks, the more likely one is to feel strongly connected to it. Future researchers should seek behavioral and attitudinal variables to create a better measure of feeling connected to the Internet than the one used in this research. In addition, multiple measures of Internet experience that capture both length of time online and the frequency of online activity may be helpful in assessing how "connected" to the Internet one feels.

This study has other limitations. A more complete model is needed for future research. For example, Yoh, Damhorst, Sapp, and Laczniak (2003) combined the theory of reasoned action (Fishbein & Ajzen, 1975) and the theory of innovations adoption to create the theoretical framework upon which their study was based. In addition, future researchers may choose to investigate other online transactions. Clearly more research is needed on who participates in online auctions and why. In future research, it may be worthwhile to investigate online travel-related transactions separately from other online shopping and online trading separately from other online financial services.

Variables unavailable in the data set used in this research should be examined. Our data set did not include any measures of respondents' computer and Internet skills, which might be important in explaining differences in online activities. Researchers at the Graphics, Visualization and Usability (GVU) Center at the Georgia Institute of Technology (1998) found that Internet users with different skill levels engaged in different online activities. Also, this research does not measure psychological aspects of respondents, such as attitude toward risks, which some research (Donthu & Garcia, 1999; Miyazaki & Fernandez, 2001; Tan, 1999) has demonstrated is useful to predict the likelihood that respondents will participate in online transactions.

Another limitation of this study is that access location is measured by where the respondents went online the day before completing this survey. It is possible that the respondents did not report the access location they usually use simply because they did not use it the day before they completed the survey. For example, a respondent may have reported s/he did not go online from work yesterday because yesterday was a weekend. So the reported access location may or may not be the respondents' regular access location. However, the data set does not provide a better measurement of the respondents' regular access location.

The findings from this study have implications for consumer educators and businesses. Consumer educators could design workshops targeting females to help them to learn how to use the Internet and about protective measures to combat privacy risks. Such learning materials could be published in media mainly catering to female audiences.

Or perhaps, demographics just are not important. The results also suggest consumer educators can increase the number of consumers who conduct online transactions by facilitating their access to their Internet and encouraging individuals to go online so they gain experience. One way to accomplish this is to offer programming or courses that increase consumers' knowledge of and comfort with computers and the Internet as well as the benefits of conducting transactions online.

Businesses could also learn from this study. Since Internet users with higher socio-economic status were more likely to adopt online shopping and online financial services, relevant Internet sites could advertise their services in media mainly targeting this group as the audience. Online auction sites could make their services more attractive to time-starved consumers by making participation in online auctions more convenient. For example, they could send the bidders online messages when someone else offers a higher bid or when the bidding deadline is approaching. Some online merchants have reduced the time commitment of buying online by allowing consumers to return items bought online to local brick-and-mortar stores. Others visualize a system in which merchandise is delivered to one's own individual curbside box, regardless of whether the resident is home or not. To increase the efficiency of online shopping transactions, perhaps a return could simply be placed in the same curbside box with prior arrangements that the delivery/pickup service would take care of the rest.

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Endnote

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