Engaging in Risk-involved Online Activities: Recognizing the Impact of Knowledge and Experience

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Abstract

Purchasing, sharing and downloading online are considered risk-involved online activities, due to concerns of privacy violations and virus infections. The current study seeks to identify factors that distinguish individuals who engage in these three activities from those who do not. Through logistic regression of data collected in 2005 by the Pew Internet and American Life Project, results showed demographic as well as resource factors to be significant predictors. In addition, the inclusion of resource factors significantly reduced demographic differences, illustrating their powerful impact. Implications for marketers and advertisers are provided.

Introduction

Approximately 1.6 billion people use the Internet worldwide, a penetration rate of 23.8%. In North America alone, approximately 251.3 million people, 74.4% of the population, are Internet users.1The Internet may be used to achieve a variety of goals: communication, to obtain information, as entertainment, and as a method of transaction.2 To achieve these goals, individuals engage in specific activities such as information search, chatting, e-mailing and downloading. Among these activities, purchasing, sharing files and downloading online are perceived to be associated with high risk due to security reasons.3 But even with such perceptions, purchasing and downloading/sharing files have become popular online activities; online retail sales exceeded $174 billion in 2007,4approximately 10 million people were peer-to-peer network users in 2006,5 and 42.1 billion music files were downloaded or shared on the Internet in 2008.6

The current study proposes that individuals, who engage in online purchasing, sharing, or downloading, may be different in their knowledge and experience of computers and the Internet (further referred to as resource factors) than those who do not engage in these activities. This may be explained by the technology acceptance model (TAM),7 which proposes that an individual's range of technology use depends on experience and perceived self-efficacy. In addition, demographic factors such as age, education, employment and race have been recognized as significant predictors of online behavior in past studies.8 Similarly, it can be posited that the characteristics of the different demographic groups will influence each groups' propensity to engage in high-risk associated online activities.

Using data collected in 2005 by the Pew Internet and American Life Project, the current study seeks to identify the factors that distinguish individuals who either (1) purchase online, (2) share files from one's own computer, or (3) download computer programs from those who do not. Although resource factors have been recognized as important predictors to the use of computers and other high-technology devices in the computer and information science literature,9 it has scarcely been discussed in the context of predicting online behavior, especially those that are associated with presenting some level of risk to the users of the medium. Specifically, the study shows the predictive powers of resource factors (i.e., knowledge and years of Internet use) and demographic factors in explaining the likelihood to engage in risk-involved online activities. In addition, the strong impact of the resource factors is further demonstrated by showing its role in attenuating the differences between different demographic groups of the likelihood to engage in these risk-involved online activities.

With decreasing sales of media products in the off-line market, companies are increasingly turning to online, building business models around purchasing, sharing, and downloading of entities. With better understanding what distinguishes those who may be likely to adopt using such services from those who may not, marketers and advertisers can better plan for their marketing and communication strategies. Implications for marketers and advertisers are provided in the discussion section of the paper.

Background

Purchasing, sharing and downloading online are considered to be highly interactive and risk-involved online activities. Although all forms of online activity (e.g., chatting, e-mailing, using search engines) accompany risks of privacy and security violations,10 purchasing, sharing, and downloading are unique in the fact that the Internet user voluntarily chooses to engage in transaction of information or entities to and from known or unknown sources. Furthermore, where passive activities such as information search, if well controlled, begin and end in Cyberspace, the actions of active online activities such as purchasing, sharing and downloading extend to some alteration in offline settings, whether it be the exchange of private information (e.g., providing credit card information), receiving of entities (e.g., receiving products purchased online), or files downloaded to the computer's hard drive (e.g., programs downloaded and installed). Because of this connection to real life entities, the dangers such as leakage of private information, identity theft and virus infection become more critical and substantial.11

Regarding online purchasing, the biggest concerns of Internet users are violation of privacy and security.12 Internet users are reluctant to provide personal information to online merchants in fear of being exposed for commercial purposes, such as having one's shopping habits tracked or personal information sold to other companies.13 In addition, the possibility of theft or leakage of identification and financial information, which may result in consequences of credit card fraud and identity theft, makes online purchasing a risk-associated activity.

In terms of sharing, depending on the connection software, peer-to-peer networks allow sharing of files that are in any form or of any content, ranging from music, movies or games to software programs. In terms of downloading, programs may be downloaded from legitimate sources such as the company's website (e.g., QuickTime Download, WinAmp Download) or download centers run by search engines (e.g., CNET download.com, Google Pack), but it can also be downloaded through unknown sources such as an individual's homepage or unofficial websites. The biggest risk associated with such sharing and downloading activities is the increased chance of being infected with spyware, adware and virus that are intentionally embedded in the files.14 In addition, free sharing and downloading of copyright files can be seen as illegal infringement, making them controversial forms of media consumption.15 Due to such concerns, sharing and downloading are also considered risk-associated.

So, why do some Internet users engage in such risk-involved activities while others do not? The current study turns to resource and demographic factors in explaining the differences between those who purchase, share, or download online from those who do not.

Resource Factors: Knowledge and Experience with the Computer and the Internet

Purchasing, sharing and downloading online involve interactions not only with the merchant, information provider, or other Internet users, but also with the computer or the Internet system itself. Even when unknown sources cannot be entirely trusted, trust in the computer/Internet system may reduce perceived risks of engaging in certain online activities, thus resulting in actual engagement.16 Past research has documented trust to be positively associated with understanding the systems of the computer and the Internet17 and such understanding is known to be acquired through experiences.18 As perceived risks involved with relatively low-risk activities (e.g., information search, e-mail, and visiting websites) are overcome through experiences with the computer/Internet, individuals may be able to have confidence in engaging in higher-risk activities (e.g., purchasing, sharing or downloading) with fewer concerns.19

Also, experience and knowledge enhances a person's self-efficacy, which has been defined as the belief of oneself having the capability to perform a particular behavior.20 With more experience and knowledge with the Internet, an individual's self-efficacy of operating on the Internet may be enhanced. These perceptions of self-efficacy towards Internet systems in general may extend to systems that provide purchasing, sharing and downloading services, lowering perceived risk toward these activities

and consequently leading to actual engagement. Not only positive experiences, but experiences challenging or interfering in nature may also reduce perceived risk and increase engagement. In the course of struggling with the negative or challenging experience, an individual may become better adapted to the situation than the person who had only been exposed to positive experiences. This is especially true for self-efficacy; a diverse range of problem-solving experiences has been known to significantly enhance a person's self-efficacy.21

Such arguments are in line with the technology acceptance model (TAM),22 which asserts that the behavioral intentions toward the use of technology is an outcome of one's attitude toward the technology, which stem from socio-structural variables, inherent characteristics, but also from one's knowledge and experience with the technology. Similarly, studies of anxiety toward computer technology emphasize the importance of knowledge and experience in overcoming technophobia.23 The studies found that the more the individuals had experiences with the computer, the lower the levels of technophobia were. Researchers label such factors of knowledge and experience as "resource factors,"24 for which the failure to obtain may lead to limited communication activities.25

Following the computer and information science literature, the current study tested for the significance of the resource factors (past problems with the computer, knowledge of Internet and system protection terms, and years of Internet) in predicting the likelihood of engaging in risk-involved online behavior of purchasing, sharing and downloading.

Demographic Factors

Demographic variables have been viewed as useful predictors of technology usage in the past. The current study uses race, education, employment and age as demographic factors which predict the engagement of individuals in purchasing, downloading, or sharing files onlin***Race***

The term, "digital divide" has often been used to describe unequal access to information technology between racial groups.26 Race has been confirmed as an important factor in Internet usage and experience, even when other socioeconomic variables are controlled.27 Studies show that among the racial groups African-Americans and Hispanic-Americans have less Internet access and the skills to use them than other groups.28 In 2007, the racial groups of Caucasian and Asian-American had relatively higher Internet access than African-Americans or Hispanic-Americans (Caucasian 75.2%, Asian-American 82.0%, African-American 59.0%, and Hispanic-American 54.8%29). This is also true for home broadband access, 69.1% of Asian-American, 54.9% of Caucasian, and 36.4% of African-American, and 35.2% of Hispanic-American households had broadband, showing African-Americans and Hispanics have lesser access. Limited access with computer and the Internet result in narrower range of experiences and knowledge. The current paper tested the possibility of access and knowledge discrepancy between racial groups by comparing the likelihood to engage in purchasing, sharing, or downloading activities between Internet users of different race.***Age***

In general, younger people are recognized as the “Internet generation,” growing up in an era of greater Internet access and state-of-the-art technology.30 Specifically, people between the ages of 20 to 30 have been recognized as the most frequent users of the Internet.31 As the age of the Internet user increases, the time spent online decreases, with the type of preferred online activities remaining inside the limited boundaries of information search and email checking.32 Social psychology literature provides findings of an interesting relationship between risk perception and age, stating that younger individuals see themselves less at risk to the negative outcomes of risk-associated behaviors. This has been termed “unrealistic optimism,”33 with which the risks involved with certain activities are understood, but failure to assess the seriousness of the outcome leads to unrealistic optimism of oneself as immune to the risks.

In align with past findings, the current paper proposes that age will be a significant influence on the likelihood of purchasing, sharing and downloading online. More specifically, it may be posited that the younger the Internet user is, due to their higher familiarity with the medium and lower risk perception, the more likely they will engage in these activities.***Education and Employment***

According to the U.S. Department of Commerce,34 individuals with higher education tend to have more experience with the Internet than those with lower education. While only 15.5% of individuals with less than high school education were frequent Internet users, 84.9% of college graduates used Internet frequently. Also, education level could be an indicator of willingness to try new technologies, which may include participating in online activities such as purchasing and downloading.35

Employment status can also be a predictor of Internet use; while 70.7% of those employed were Internet users, only 42.8% of those unemployed used the Internet.36 Also, the percentage of people living in broadband households, which can be indicative of faster and better access to the Internet, was greater for people who were employed than those who were not.

The experience and accessibility of the Internet can have an influence on the online behavior one chooses to engage in. The current study predicts that the higher the individual’s education and employment status, the more likely they will engage in behaviors of purchasing, sharing and downloading online.

Hypotheses

Based on this literature review, the following hypotheses are presented:

- **H1:** Resource factors (problems with the computer, knowledge and years of Internet use) will

significantly predict the likelihood of engaging in risk-involved online activities of purchasing, sharing, and downloading.

- **H2:** There will be significant differences between race-ethnicity groups in their likelihood to engage in risk-involved online activities of purchasing, sharing, and downloading.
- **H3:** Age will significantly predict the likelihood of engaging in risk-involved online activities of purchasing, sharing, and downloading.
- **H4:** There will be significant differences between people of different education and employment status in their likelihood to engage in risk-involved online activities of purchasing, sharing, and downloading.
- **H5:** Resource factors will be a strong predictor of the likelihood to engage in risk-involved online activities as to reduce significant group differences in demographic factors of race-ethnicity, age, education, and employment.

Method

Data

The data used in this study were drawn from the May-June 2005 Spyware telephone survey collected by the Princeton Survey Research Associates International for the Pew Internet and American Life Project. The sample was drawn using a standard list-assisted random digit dialing (RDD) methodology. From a sample of 2,001 adults 18 and older living in continental United States telephone households, 1,319 (65.9%) were extracted as Internet users. After eliminating cases with missing data on the key predictor variables, the total sample for analysis came to be 1,152. When conducting the logistic regression, we eliminated cases with missing data for the three dependent variables, producing the total number of cases analyzed as: 1,151 for purchasing, 1,152 for sharing and 1,149 for downloading. To detect multicollinearity, collinearity statistics were assessed using SPSS; the R2 value was a relatively low .171 and all values for the Variance Inflation Factor were lower than 4.0, a common cut-off criterion.37 Together, they indicate low multicollinearity.***Dependent Measures***

Three variables were used for dependent measures in separate analyses: (1) buying products online, (2) sharing files from one's own computer and (3) downloading computer programs. The answers to these dependent measures were given in a yes or no format, which was coded as 1 and 0, respectively.***Resource Factor Measures***

Resource factor measures were indicative of the Internet user's knowledge and experience with the computer and the Internet. Years of Internet use was measured in years an individual had been an Internet user. Knowledge of Internet was an additive index that was created by summing the scores from six items asking whether or not the respondent had a good idea of Internet-related terms: firewall, Internet cookies, spyware, adware, Internet phishing and spam (M = 4.11, SD = 1.67, Cronbach's ? = .75). Respondents' answers to "have a good idea of what this term means," was coded as 1 and, "not

really sure what this means," and "never really heard of this term," was coded as 0. Adding the scores for all six items, a respondent's score could range from 0 to 6. Problems with the computer was another additive index created by summing four items which asked whether or not the respondent had problems with the computer. The specific problems mentioned were: computer slowing down, computer freezing up or crashing, Internet home page changing without resetting, new program or icons suddenly appearing on the computer that wasn't installed (M = 1.44, SD = 1.28, Cronbach's = .67). All items were recoded to yes as 1 and no as 0, resulting in the additive index to range from 0 to 4..***Demographic Measures***

Race, age, last level of education and employment status were selected for demographic measures. Race was measured with a set of dummy-coded variables for Caucasian, African-American, Asian-American, Hispanic-American and others (Native American and mixed race). Caucasian was excluded from the equations to represent the reference category. Age was a continuous variable measured in years. Last level of education was also coded into a set of dummy-coded variables as less than high school (none to high school incomplete), high school graduate, some college (technical, trade, or vocational school after high school, some college, no four-year degree), college graduate and post-graduate. Less than high school served as the reference category. Employment status was coded as a set of dummy-coded variables with full time, part time, retired and all others as not employed (disabled, student, other). Employed full time was the reference category.

Results

Descriptive Variables

Table 1 presents means and standard deviations for variables used in the logistic regression analysis. Approximately 71% of Internet users have purchased online, 27% have shared files from their own computer, and 40% have downloaded computer programs. In terms of their demographics, with a mean age of 44.16, 82% were Caucasian, 8% were African-American, 2% were Asian-American, 5% was Hispanic-American, and 2% replied as other. Most attended some college (31%), were college graduates (26%), high school graduates (25%), and was followed by education post-college (15%) and less than high school (3%). For knowledge, which was an additive index created with six items, the average score was 4.08. Also as an additive index of four items, the average number of problems the respondents experienced with their computer was 1.44. The average years of Internet use was 7.35.

When comparing percentages across race-ethnicity groups, the data showed that Caucasians (73%) purchased online significantly more than African-Americans (58%) and other race (57%). For sharing and downloading of computer programs, no racial group had significantly different values than Caucasians. For education level, more Caucasians (43%) than Asian-Americans (4%) replied they were high school graduates, significantly less Caucasians (3%) than Hispanic-Americans (14%) had less than high school graduation, while Caucasians (27%) had a significantly higher percentage of college

graduate Internet users than Hispanic-Americans (14%). For employment status, more African-Americans (68%) had full time employment than Caucasians (55%) while more Caucasians (17%) were retired than African-Americans (8%) or Hispanic-Americans (6%). Mean of age was significantly different between Caucasian and all other race groups, with Caucasian (45.74) having a higher mean age than African-American (39.08), Asian-American (38.52), Hispanic-American (31.90), and other (38.77). For knowledge, the difference between Caucasian (1.69) and African-American (3.30) was significant, for years of Internet use, the difference between Caucasian (7.50) and African-American (6.58) and Caucasian and Hispanic-American (5.79) was significant, and for problems with the computer, African-Americans (1.82) had a significantly higher mean than Caucasians (1.41).

Table 1

Descriptive Analysis

	Full Sample	Caucasian	African-American	Asian-American	Hispanic-American	Other						
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Online Activities												
Purchase online (1151)	.71**	.46**	.73 (949)	.44**	.58**	.50**	.57**	.51**	.70**	.46**	.50**	.51**
Share files	.27**	.44**	.26**	.44**	.31**	.47**	.26**	.45**	.33**	.48**	.35**	.49**
Download computer programs (1149)	.40**	.49**	.40 (947)	.49**	.32**	.47**	.30**	.47**	.48**	.50**	.50**	.51**
Race-Ethnicity												
Caucasian	.82**	.38**										
African-American	.08**	**z.27**										
Asian-American	.02**	.14**										
Hispanic-American	.05**	.23**										
Other	.02**	.15**										
Age	44.16**	15.38**	45.74**	15.29**	39.08**	13.18**	38.52**	11.92**	31.90**	11.68**	38.77**	17.58**
Education												
Less than high school	.03**	.18**	.03**	.17**	.02**	.15**	.09**	.29**	.14**	.35**	.00**	.00**
High school graduate	.25**	.43**	.24**	.43**	.26**	.44**	.04**	.21**	.35**	.48**	.35**	.49**
Some college	.31**	.46**	.31**	.46**	.38**	.49**	.26**	.45**	.24**	.43**	.38**	.50**
College graduate	.26**	.44**	.27**	.44**	.26**	.44**	.39**	.50**	.14**	.35**	.15**	.37**
Post College	.15**	.36**	.16**	.36**	.09**	.29**	.22**	.42**	.13**	.34**	.12**	.33**
Employment												
Full time	.57**	.50**	.55**	.50**	.68**	.47**	.65**	.49**	.57**	.50**	.69**	.47**
Part time	.13**	.34**	.13**	.34**	.10**	.30**	.13**	.34**	.14**	.35**	.04**	.20**
Retired	.15**	.36**	.17**	.36**	.08**	.27**	.00**	.00**	.06**	.25**	.15**	.37**
Not employed	.15**	.36**	.15**	.36**	.14**	.35**	.22**	.42**	.22**	.42**	.12**	.33**
Knowledge	4.08**	1.69**	4.18**	1.62**	3.30**	2.00**	4.00**	1.95**	3.83**	1.80**	4.12**	1.86**
Years of Internet use	7.35**	4.25**	7.50**	4.20**	6.58**	4.17**	7.91**	4.73**	5.79**	3.61**	7.85**	6.14**
Problems with the computer	1.44**	1.28**	1.41**	1.27**	1.82**	1.32**	1.35**	1.30**	1.29**	1.21**	1.54**	1.21**
N of cases	1,152	950	90	23	63	26						

** The group mean is significantly different from the mean for Caucasian at p < .01.

** The group mean is significantly different from the mean for Caucasian at p < .05.

Multivariate Analysis

Table 2 presents three sets of logistic regression equations with each predicting the log-odds of purchasing online, sharing, and downloading computer programs. Models 1, 3 and 5 include race, last level of education, current employment status, age and experience of problems with the computer. Problems with the computer were included in the first set of models with the demographic variables for each dependent variable because preliminary analysis showed this variable enhanced the demographic effects. Models 1, 3 and 5 served as the baseline equation, which was compared with Models 2, 4 and 6, the models that included the variables of knowledge and years of Internet use.

For the log odds of purchasing online, Model 1 showed that African-Americans (-.908; p < .01), Asian-Americans (-1.068; p < .05), and other (-1.181; p < .01) had significantly lower log-odds than Caucasians (support for H2). Each year of increase in age (-.016; p < .01) significantly decreased the log-odds of purchasing, while increase in problems with the computer (.165; p < .01) significantly increased the log-odds (support for H3). Internet users with higher education, high school graduates (1.079; p < .01), some college education (1.458; p < .01), college graduates (1.849; p < .01), and post college education (2.477; p < .01), were more likely to purchase online than Internet users with lower level education of less than high school. Education level was the strongest predictor in the model with high school graduate 2.9 times, some college 4.3 times, college graduate 6.4 times, and post college education 11.9 times more likely to purchase online than less than high school Internet users. Those who were employed part time (-.533; p < .01) were significantly less likely to buy online than full time employees (support for H4). The likelihood of online purchasing was not significantly different between full time and retired or between full time and not employed Internet users.

Model 2 incorporated knowledge and years of Internet use, which was indicative of the technology resources available to the individual. As expected, increase in knowledge (.323; p < .01) and years of Internet use (.081; p < .01) significantly increased the log-odds of online purchasing (support for H1). Knowledge and years of Internet use reduced differences between full time/part time log-odds of purchasing online by 39.8% (-.533 to -.321) and reduced the age effect by 37.5% (-.016 to -.010), both to nonsignificance. Although remaining statistically significant at the .05 level, the difference between education levels was reduced, between less than high school individuals and high school graduates by 27.2% (1.079 to .785), some college by 37.3% (1.458 to .914), college graduates by 35.9% (1.849 to 1.186), and post college by 28.8% (2.477 to 1.764). For race, although remaining significant, the log-odds of purchasing online was increased for African-Americans by 41.1% (-.908 to -.535), for Asian-American 6.6% (-1.068 to -.997), thereby decreasing the Caucasian-African-American and Caucasian-Asian-American log-odds differences, but the coefficients for the other race category decreased by 7.7%

(-1.181 to -1.272), making racial group effects stronger. Unlike African-Americans and Asian-Americans, who with the knowledge and experience had an increase in the log-odds of purchasing online, people in the other race category tended to purchase even less with the knowledge and experience factored in the model. Although remaining statistically significant, problems with the computer effect was also reduced by 6.7% (.165 to .154) (support for H5).

For the log odds of sharing files from one's own computer, Model 3 showed no significant race effects (no support for H2). Each year of increase in age (-.023; $p < .01$) decreased the log-odds of online file sharing (support for H3). People working part time (.423; $p < .05$) and who were not employed (.455; $p < .05$) had significantly higher log-odds of sharing files online than full time employees (support for H4). In addition, increase in problems with the computer (.111; $p < .05$) significantly increased the log-odds.

Again, knowledge and years of Internet use were incorporated in Model 4, and both were highly significant, with increase in knowledge (.162; $p < .01$) and years of Internet use (.035; $p < .05$) increasing the log-odds of online file sharing (support for H1). All significant coefficients in Model 3 remain significant in Model 4, some with reduced effect: problems with the computer by 4.5% (.111 to .106), and not employed by 6.6% (.455 to .425), and some with increased effect: part time by 45.2% (.423 to .614) (support for H5).

Model 5 for downloading computer programs showed the log-odds of African-Americans (-.505; $p < .05$) to be significantly lower than Caucasians (support for H2). As age increased by year (-.018; $p < .01$), the log-odds significantly decreased (support for H3). Post college educated people (.904; $p < .05$) had significantly higher log-odds of downloading computer programs online than people with education levels of less than high school. For employment status, unemployed (-.448; $p < .05$) had significantly lower log-odds of downloading computer programs than full time workers (support for H4). Increase in problems with the computer (.130; $p < .01$) significantly increased the log-odds of downloading computer programs.

Incorporating knowledge and years of Internet use into Model 6 of downloading computer programs, it showed that increase in knowledge (.414; $p < .01$) (support for H1), but not years of Internet use, significantly increased the log-odds of downloading computer programs online. Inclusion of the two variables explained away the difference between Caucasian and African-American by 74.1% (-.505 to -.131), post college and less than high school by 75.3% (.904 to .223), and not employed and full time by 18.8% (-.448 to -.364), all to nonsignificance. Age and problems with the computer, although remaining significant, were reduced in their coefficients by 27.8% (-.018 to -.013) and 9.2% (.130 to .118), respectively (support for H5).**Table 2**

Logistic Regression of Online Purchasing, Sharing, and Downloading

	Purchase Online** **	Share Files ** **	Download Computer	Programs		
Variables	(1)	(2)	(3)	(4)	(5)	(6)
Race-Ethnicity						
Caucasian*						
African-American	-.908**	-.535**	.094**	.258**	-.505**	-.131**
Asian-American	-1.068**	-.997**	-.193**	-.014**	-.696**	-.644**
Hispanic-American	-.104**	.125**	.048**	.572**	.230**	.433**
Other	-1.181**	-1.272**	.320**	.368**	.328**	.404**
Education						
Less than high school*						
High school graduate	1.079**	.785**	.129**	-.097**	-.099**	-.481**
Some college	1.458**	.914**	.153**	-.258**	.242**	-.358**
College graduate	1.849**	1.186**	.119**	-.349**	.561**	-.105**
Post College	2.477**	1.764**	.365**	-.251**	.904**	.223**
Employment						
Full time*						
Part time	-.533**	-.321**	.423**	.614**	-.274**	-.087**
Retired	-.442**	-.222**	-.315**	-.017**	-.181**	.048**
Not employed	-.097**	.003**	.455**	.425**	-.448**	-.364**
Age	-.016**	-.010**	-.023**	-.024**	-.018**	-.013**
Problems with the computer	.165**	.154**	.111**	.106**	.130**	.118**
Knowledge		.323**		.162**		.419**
Years of Internet use		.081**		.035**		.029**
Constant	.133**	-1.530**	-.457**	-1.069**	.022**	-1.745*
Pseudo R-square	.130**	.232**	.078**	.107**	.078**	.185**
N	1151	1152	1149			

** p< .01, * p < .05. Logit coefficients presented.

*Omitted category.

Discussion and Implication

The current study set out to identify the significant factors that predict online behavior of Internet

users. Building on past research which recognizes the importance of knowledge and experience as predictors of an individual adapting to technology, the study predicted these resource factors, with the addition of demographic factors, would also be significant predictors of Internet users' propensity to engage in online-activities, especially to those that are risk-involved.

As suggested by theories of self-efficacy and technology acceptance model (TAM), resource variables (problems with the computer, knowledge of Internet terms, and years of Internet use) were significant factors in increasing the likelihood of engaging in risk-involved online activities for all six models, with the exception of Model 6, where the effects of years of Internet use were nonsignificant. The more problems experienced with the computer/the higher the knowledge of Internet terms/the more years of Internet use, the more likely the Internet user purchased online, shared files from their own computer, and downloaded computer programs. In addition, the strong impact of the resource factors was shown by its power to attenuate the differences between the likelihood of engaging in risk-involved online activities of different demographics.

Observing each online activity in more detail, for purchasing online, Caucasians, more so than African-American, Asian-American and other race, were likely to purchase online. Education was a strong predictor in that people with high education were significantly higher in their likelihood to purchase online than those with a low level of education. People employed full time purchased more online than part time. This aligns with previous research, where employment was reported to be predictive of frequency of Internet access, which may lead to more experience and knowledge, consequently leading to higher confidence to engage in risk-associated online activities. Also, although income level was not included in the models, full time employment can be associated with higher income levels than part time, which could be a direct indicator of purchasing. The inverse relationship between age and online purchasing has also been previously hypothesized, the discrepancy resulting from younger individuals' greater knowledge, experience, and optimism towards assessing risk. The last inclusion in Model 1, having had problems with the computer in the past, significantly increased the likelihood to purchase. Having had problems may be indicative of having experienced more diverse situations dealing with computers. Such experiences could enhance a person's abilities to adapt, explore, and take risks when engaging in online activities.38

For purchasing online, inclusion of knowledge and years of Internet use in the model significantly lessened some of the differences between levels of key demographic factors, indicating the importance of the resource variables in predicting online behavior. The racial difference effects between Caucasian/African-American and Caucasian/Asian-American were attenuated; it seemed that with more knowledge and years of Internet use, African-Americans and Asian-Americans tended to purchase more online. The strong education effect was also attenuated by the two resource factors, lessening the gap between the likelihood of purchasing online for Internet users of less than high school education and people of higher education levels. For employment status, the difference between full time/part time employees was explained away by higher levels of knowledge and Internet use. As mentioned previously, looking at the initial model without the two resource variables, it seems plausible to infer that the higher purchase likelihood of people employed full time than those employed part time may be the cause of differences in disposable income, presumably higher for people employed full time. But

observing the differences in employment status being explained away by the two resource variables may be indications of the resource factors being stronger predictors related to employment status than any other factors not included in the model, such as income or gender. People who work full time may have more experience with and access to technological resources and consequently, have a higher probability to purchase online compared to others with different employment status. Lastly, the age effect for online purchasing is significantly reduced when resource variables are considered. As Internet users had more knowledge and experience with the Internet, the significant difference of likelihood of purchasing online between younger and older users were reduced.

Unlike what past literature has implied, for sharing files from one's own computer, people working part time and unemployed were more likely to share files online than those employed full time. Considering that many companies limit the kinds of online activities an employee can engage in during office hours, this seems plausible. Activities such as sharing or downloading may be prohibited, even systematically blocked to protect company property and increase work efficiency. This may not be true for part time or unemployed individuals, who may have lesser restrictions concerning the use of P2P connections and computer systems. Thus, even with the inclusion of resource variables, the differences between full time/part time and full time/unemployed Internet users were not attenuated. Rather, armed with knowledge and experience, part time and unemployed individuals showed greater propensity to share files over the Internet.

For downloading computer programs, Caucasians downloaded significantly more than African-Americans, post college individuals downloaded more than less than high school individuals, full time employees significantly more than not employed individuals, and younger users significantly more than older users. Such finding overlaps with past literature, where African-Americans (less than Caucasians), people of lower education, and people of unemployed status have less access and experience with the computer and the Internet. Unlike sharing files, which requires access to networks that may be blocked by the company, computer programs can be downloaded as freeware and shareware through unrestricted yet legitimate routes. Therefore, it may be plausible that while higher employment status equaled less sharing online, the opposite may be true for downloading computer programs. As with all other dependent variables, age was a significant factor, which showed an inverse relationship with downloading. Knowledge and years of Internet use accounted for the difference between Caucasians and African-Americans, less than high school and post college education, by reducing the effects to nonsignificance. Age and problems with the computer, although significant, was also reduced in effect, again emphasizing the importance of resources in predicting engagement in risk-involved online activities.

Overall, the resource variables, knowledge and years of Internet use, had a significant effect on the demographic differences of engaging in risk-associated online activities, explaining away the difference between groups of race, employment status, and age for certain dependent variables. Even when the resource factors did not fully discount the demographic differences, they attenuated the effects, making the differences smaller. Such outcome reiterates the importance of knowledge and experience in predicting online activities, especially those that are risk-involved and require active participation.

For marketers, these findings give implications as to who may likely engage in profit-generating online activities, not only online purchasing, but also sharing or downloading. This is especially important at a stage where the media industry is turning to building business models with the latter two.39 Amazon has newly launched its digital-music downloading service, selling restriction-free single tracks from more than 20,000 record labels. This is in response to the yearly decrease in record sales but surging of online downloading of single tracks. Amazon also offers video downloading of TV series and movies in Amazon Unbox. This is a challenge to the exclusive position that Apple iTunes had held since their launching of music download services. Stores such as Cinemanow.com and Movieflix.com have built business models around downloading and sharing of video files, charging per file/movie or monthly membership fees. Computer programs are downloadable on the company's websites (e.g., Norton AntiVirus) or other sites providing a compilation of software through premium downloads (e.g., PCMag.com). In determining the target group, because propensities to engage in risk-involved online activities are different between groups of key demographic factors (e.g., age, education, income, employment status), these factors could be set as the primary determination factors. But marketers need to keep in mind that resource factors can override demographic differences in the likelihood to engage in risk-involved activities.

It may be efficient to first target potential early adopters, those that are already equipped with wide-range and long-term Internet experience, but to also attract consumers with lesser self-efficacy, marketers need to explore ways to educate and persuade them to first adopt the technology. Step-by-step instructions on how to operate the system and risk-free trials may help facilitate consumers into initial trial. Also, risk-involved online activities accompany risks regarding security breach, identity theft, and virus infection. In dealing with a target market with less knowledge and experience with the Internet, providing consumers with safety nets (e.g., lenient return policies, trustworthy security systems) may reduce perceived risk, which may encourage them to engage in the activities. With their "foot in the door," consumers could find it easier to return for subsequent trials and expand to a wider range of activities, exploring different functions or options provided by the services.

The findings have implications for advertisers also. Often times, advertising strategies for new technology products focus on the benefits that the product has to offer. This often translates into "what it can do" messages. This may be successful in drawing in the consumers with knowledge and adapting abilities, but for less affluent consumers, first adoption may be an intimidating process. If it is judged that the target consumers include not only expert consumers, but also those that are less affluent, it may be helpful to employ message strategies that include information on how certain processes work. Also, messages that employ "what you can do" strategies may increase self-efficacy and lead to trial. As previously discussed, the initial trial is important in the individual returning for consecutive trials. It may be wise to feature the strongest and simplest function/benefit of the service in ad messages than to provide multiple and complex functions. Persuasion with a single, but strong benefit may lead to the first trial, which would decrease perceived risk and subsequently lead to broader range of activities.40

Limitations and Future Suggestions

As with all research, the outcome is not to be taken without consideration of study limitations. The current study included only Internet users in the analyses, which is in accord with the study objective to learn the impact of resource and demographic factors on engagement of risk-involved online activities. But for comparison purposes, future research should additionally observe non-Internet users to understand how they differ in the likelihood to engage in certain activities from those of veteran Internet users.

The assertion that the activities of purchasing, sharing and downloading online involve risks was established from past literature. To better understand the relationship between perceived risk, resource factors, and likelihood to engage in these online activities, future studies could directly measure perceived risk as well as include them in the analysis models.

Also, factors such as income level and gender may be influential in increasing the fit of the regression models. Income level may not only directly influence online purchasing behavior, but it may also have implications as to the kind of resources that may be available to the individuals. For gender, past research has indicated that male individuals have more positive attitudes toward technology than females.41 On the other hand, studies on online shopping behavior indicate that females engage in online shopping significantly more so than males.42 These differences in attitudes and behavior will likely influence propensities toward other online activities. Future research could incorporate these additional demographic variables to see how it predicts the likelihood of engaging in purchasing, sharing and downloading online.

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