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The Role of Experience on Consumer E-Commerce

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ABSTRACT

Recent studies suggest that e-shopping appears to be well modeled by technology adoption models, particularly the Technology Acceptance Model (TAM). However, e-commerce is fast maturing, and many customers have moved beyond adoption and have become experienced. As e-commerce grows and consumers build experience, it is becoming imperative to develop a better understanding of the role of experience on e-shoppers.

This study examines the role of experience on consumers’ intentions to purchase online and their perceptions of usefulness. The model showed a good fit (X²=3.96, df=2, X²/df=1.98, p=0.14, AGFI=0.97) and a particularly strong prediction of intention to shop (r²=.70). Experience has both direct and indirect effects on intention to use and moderating effects on antecedents to intention such as perceived usefulness, playfulness, and self efficacy.

Keywords  
Technology Acceptance Model, information technology adoption, business-to-consumer electronic commerce, Internet shopping

INTRODUCTION

Business-to-consumer e-commerce continues to grow at a rapid pace. In the fourth quarter of 2002, 13 billion dollars was spent on web purchases, up 24% from the prior year. Further, half of all Internet users now obtain product information from the web prior to purchasing goods and services. Not surprisingly, a variety of businesses, especially brick and mortar companies, are making substantial e-commerce investments (Agarwal and Prasad, 1998). However, many of these attempts are employed with little theoretical support, and the results have been disappointing.

One poorly understood e-commerce issue is e-shopping experience. As e-commerce grows and consumers build experience, it is becoming imperative to develop a better understanding of the role of experience on e-shoppers. More specifically, does an individual’s experience with online shopping increase the likelihood that individual will continue to shop online, or does experience influence the factors that affect the likelihood of continued e-shopping activities. If experience influences the factors leading to e-shopping activities, which factors are affected? As businesses continue to invest in e-commerce, it is important to understand the effects of experience on consumers’ behaviors so that e-shopping sites maybe tailored to take advantage of the different behaviors and factors that vary based on experience.

Recent studies suggest that e-shopping appears to be well modeled by technology adoption models, particularly the Technology Acceptance Model (TAM) (Gefen and Straub, 2000, Lederer et al., 2000, Lee et al., 2001, Lin and Lu, 2000, Liaw, 2002, Teo et al., 1999) and improvements to TAM (Childers et al., 2001, Dishaw and Strong, 1999, Keil et al., 1995). However, e-commerce is a fast maturing industry, and many consumers have moved well beyond the initial adoption phase of online shopping and have become experienced e-shoppers. Now, a major issue is how to adapt technology acceptance models to include measures of experience.

How might experience be modeled in TAM or TAM-like models? One simple approach is to add experience within the model as another factor that leads directly to intention to e-shop. A second approach would be to suggest experience effects intention indirectly; that is, experience influences intention to e-shop via other factors such as perceived usefulness or playfulness. A third approach would be to suggest that experience moderates or changes the factors that lead to intention to e-shop. In other words, factors in the TAM model would be different for experienced and inexperienced e-shoppers.

LITERATURE REVIEW

General research on experience suggests that experience allows decision makers to learn and adapt behaviors and cognitive processes. By using feedback from previous experiences and trials, decision makers adapt their cognitive processes as well as their performance. Users go through a period of relatively rapid improvements when salient errors are corrected until they
reach a satisfactory level of performance. Improvements are typically gradual, can take many years, and are specific to a particular decision context or domain (Ericsson, 1998).

Before examining the impact of experience on e-shopping in particular, it is useful to briefly review how experience influences decision makers in other contexts. In general, experience has been shown to greatly improve decision making in a wide range of decision settings (Richman et al., 1996, Ericsson, 1996). There are a number of advantages for experienced decision makers: experience increases the accuracy of information searches, gives a richer conceptual model of the decision task, automates pattern matching of problems with solutions, increases knowledge of which cues to sample to diagnose situations quickly, improves recall, and enhances perception. (Klein, 1993). Other advantages include forward reasoning--practiced decision makers reason from symptoms to hypotheses; less practiced decision makers work backward from hypotheses (Richman et al., 1996). Experience enhances the ability to revisit information and conduct higher levels of searching and evaluating, improves error checking, extrapolates beyond the presented data, improves data scrutinizing, leads to development of a long term memory that is richer and more organized, and leads to more effective use of short term memory (Ericsson, 1996, Richman et al., 1996). More generally, experience results in significant changes to decision makers’ representation of a domain which permits enhanced planning, modification, reasoning, monitoring, and feedback (Ericsson, 1998). Further, more experienced decision makers classify events within these schemata based on principles—deep cues of the nature of the problem—in contrast to less experienced decision makers who are thought to use more superficial features (Chi et al., 1988, Federico, 1995, Orasanu and Connolly, 1993, Prietula and Simon, 1989).

The Technology Acceptance Model (TAM) has been used extensively to model e-shopping (Gefen, 2003, Gefen et al., 2003, Lederer et al., 2000, Lee, 2002, Moon and Kim, 2001). However, the role of experience on TAM in the e-shopping domain has been examined in only a few of these studies. Further, no e-shopping studies that examine experience have modified the original TAM model to include factors like site playfulness, self efficacy of the user, or task technology fit. Our study modified TAM by including these factors and examining the effects of experience on the model (see Figure 1). In particular, we looked at direct, indirect, and moderating effects of experience.

The purpose of this study was to examine the effects of experience on intention to e-shop. A necessary first step was to determine a baseline model of e-shopping without experience. Once the baseline model (see Figure 1) was established, we added experience and tested for changes. We constructed the improved TAM shown in Figure 1 using improvements common to other studies (Agarwal and Prasad, 1998, Jarvenpaa and Todd, 1997, Liaw, 2002, Taylor and Todd, 1995, Venkatesh, 2000). We also modified the model by removing the relationship between Perceived Usefulness (PU) and Perceived Ease of Use (PEU). The elimination of this relationship has been done in other studies (Childers et al., 2001, Keil et al., 1995, Lederer et al., 2000) because it is the weakest link in the model. Self Efficacy (SE), Playfulness (PL), Task Technology Fit (TTF), and Sex have been added as antecedents to Intention to Use (IU). These antecedents have been used to modify TAM in many other studies (Brosnan, 1999, Cheung et al., 2000, Dishaw and Strong, 1999, Moon and Kim, 2001, Taylor and Todd, 1995, Venkatesh, 2000).

![Figure 1. Modified TAM](image-url)
HYPOTHESES

A number of studies have shown that e-commerce experience has a positive direct effect on future intention to e-shop (Al-Gahtani and King, 1999, Dishaw and Strong, 1999, Gefen, 2003, Liao and Cheung, 2001). We expect to find in our study that prior e-shopping experience is directly related to intention to e-shop. E-shoppers, we believe, have developed the habit or routine of e-shopping and will continue to do so without much reflection or rational analysis. This habit–direct effect has been found for e-shoppers continuing to use a particular website (Gefen, 2003). In this study we generalize habit or experience beyond one website to e-shopping in general. Not only should habit increase the likelihood for subsequent e-shopping, experienced shoppers, like experienced decision makers in general, have planning, reasoning, and classification advantages that should improve their e-shopping decision making and thereby encourage subsequent e-shopping activities.

H1: Actual e-shopping experience has a positive direct effect on future intention to e-shop

In addition to direct effects, we expect experience will impact intention to e-shop in an indirect manner. Moreover, we believe that these indirect effects may be more important to subsequent intention to e-shop than the direct effect. Previous non e-commerce TAM research has shown that experience exerts an indirect effect on intention through PU and PEU (Venkatesh et al., 2000). Within the e-shopping domain, Gefen (2003) found a significant indirect effect through both PU and PEU. However, unlike our study, his TAM model did not include antecedents of intention to e-shop other than PU and PEU. Other studies found the indirect effect to be equal to or less than the direct effect (Thompson et al., 1994, Venkatesh et al., 2002). However, one of these studies claimed that all effects of experience on intention would be indirect through TAM factors PU and PEU (Venkatesh et al., 2002).

As other research (Bellman et al., 1999) has shown, intention to e-shop is not just a function of PU and PEU, but also the playfulness of the site (Moon and Kim, 2001), the self efficacy of the e-shopper (Venkatesh, 2000), and the fit between the e-shopping task and the technology used to accomplish that task (Dishaw and Strong, 1999). We expect by including these additional factors the indirect effect of experience on intention to e-shop will be much more pronounced.

H2: Actual e-shopping experience has a positive indirect effect on intention to e-shop.

If indirect effects are significant, it is necessary to identify which indirect effects are important. We do this by testing for moderating effects. That is, if experience influences intention through intermediate factors such as playfulness, self efficacy, task-technology fit, and perceived usefulness, it is important to identify which of these factors are most moderated by experience. We expect that experience moderates the effect of many of these factors on intention to e-shop.

Thompson (1994) over 10 years ago, suggested moderating influences of experience on office software adoption were very significant. Since then, the only studies of technology adoption that have tested moderating effects of experience concern technology adoption in general and none in e-commerce specifically. In one of the two studies, Taylor and Todd (1995) concluded that while TAM is appropriate for both experienced and inexperienced users; it explains more of the inexperienced users’ behaviors and that PU is a more important construct to inexperienced users’ behaviors than to experienced ones. In the other study, (Venkatesh et al., 2000) suggested that experience (combined with gender) plays a moderating effect on the relationship between subjective norms and intention.

H3: Actual e-shopping experience has significant moderating effects on intention to e-shop.

METHOD

The research questions were examined in the context of online shopping activities. To examine the effects of experience on intention to shop online, a survey was administered to undergraduate students at a mid-west university. The data collection procedures, respondents, and instrument development are described next.

Procedures and Respondents

The respondents for this study were 826 undergraduate students. The students were in either marketing or management information system classes. Although students are not representative of all consumers, these future consumers are important as they represent the future of e-commerce purchasing activities (Hogg et al., 1998, PRNewswire, 2000, Silverman, 2000, Yoo and Donthu, 2001). Permission was obtained from instructors to enter their classrooms, explain the purpose of the study, and to ask for volunteers. Respondents were given a random user ID and password to retrieve the questionnaire from a
website. The questionnaire consisted of 17 items plus three questions to gather demographic information and took approximately 10 minutes to complete. Of the 826 students, 546 participated providing a response rate of 66%—56% were male and 44% were female. Most of the respondents (77%) were between 20 to 25 years of age. The majority of respondents were juniors (37%) and sophomores (34%). Because of the homogenous nature of these respondents, we did not check for non-bias response.

Instrument Development

The initial version of the instrument was pilot tested with 88 volunteers from marketing courses other than those used for the research project. Based on the feedback received from the pilot test, some questions were reworded and/or deleted. Cronbach’s Alpha was used to analyze the data from the pilot study resulting in eliminating questions that were similar or did not measure the construct. The scales used to measure perceived usefulness, perceived ease of use, intention to use, and actual use, were adapted from Davis’ research (1989), and the scales used to measure task-technology fit were adapted from Goodhue’s research (1995). Experience was measured by asking how frequently (many times a week) did the respondents engaged in online shopping activities. All items were measured on a five-point Likert scale with end points of “strongly agree” and “strongly disagree.” Cronbach’s alpha was used to measure the internal consistency of the individual scales. The tests for internal consistency were satisfactory, see Table 1.

<table>
<thead>
<tr>
<th>Scale Items</th>
<th>Mean</th>
<th>S.D.</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived usefulness (PU)</td>
<td></td>
<td></td>
<td>0.83</td>
</tr>
<tr>
<td>PU1</td>
<td>2.17</td>
<td>0.95</td>
<td></td>
</tr>
<tr>
<td>PU2</td>
<td>2.31</td>
<td>0.97</td>
<td></td>
</tr>
<tr>
<td>PU3</td>
<td>2.55</td>
<td>0.97</td>
<td></td>
</tr>
<tr>
<td>Intention to use (IU)</td>
<td></td>
<td></td>
<td>0.86</td>
</tr>
<tr>
<td>IU1</td>
<td>2.41</td>
<td>0.88</td>
<td></td>
</tr>
<tr>
<td>IU2</td>
<td>2.55</td>
<td>1.02</td>
<td></td>
</tr>
<tr>
<td>IU3</td>
<td>2.64</td>
<td>1.01</td>
<td></td>
</tr>
<tr>
<td>Task-technology fit (TTF)</td>
<td></td>
<td></td>
<td>0.82</td>
</tr>
<tr>
<td>TTF1</td>
<td>2.02</td>
<td>0.82</td>
<td></td>
</tr>
<tr>
<td>TTF2</td>
<td>2.26</td>
<td>0.73</td>
<td></td>
</tr>
<tr>
<td>TTF3</td>
<td>2.19</td>
<td>0.67</td>
<td></td>
</tr>
<tr>
<td>TTF4</td>
<td>2.43</td>
<td>0.77</td>
<td></td>
</tr>
<tr>
<td>TTF5</td>
<td>2.36</td>
<td>0.78</td>
<td></td>
</tr>
<tr>
<td>TTF6</td>
<td>2.22</td>
<td>0.65</td>
<td></td>
</tr>
<tr>
<td>TTF7</td>
<td>2.49</td>
<td>0.77</td>
<td></td>
</tr>
</tbody>
</table>

Table 1. Descriptive Statistics and Cronbach’s Alpha

Data Analysis

The data were analyzed with the using the CALIS procedure in SAS. “Path analysis is a method of measuring the influence of explanatory variables along each separate path in a system and finding the degree to which variation of a given effect is determined by each particular cause” (Teo et al., 1999), p. 30). Path analysis is a multivariate analytical methodology for empirically examining sets of relationships in the form of linear causal models (Duncan, 1986, Li, 1975).

RESULTS

All three hypotheses were supported. The hypotheses were tested using path analysis. This procedure is consistent with the methodology used by others in similar studies (Dishaw and Strong, 1999, Lee et al., 2001, Magal and Mirchandani, 2001, Teo et al., 1999). The results of the analysis are summarized in Table 2. The model fit was well within acceptable thresholds ($X^2=3.96$, $df=2$, $X^2/df=1.98$, $p=0.14$, AGFI=0.97), and there was a particularly strong prediction of intention to shop ($r^2=.70$).
For comparative purposes, the direct effect of each of the five antecedents on intention to use was measured. The results of this analysis are displayed in the first column of Table 2. Next, we added the paths linking experience to each of the antecedents and a path from experience to intention to use. These results are shown in the second column of Table 2. The relationship between experience and intention to use was significant (path coefficient = .10; t = 4.3; p < .001). Hypothesis 1 was supported.

In order to ascertain the total indirect effect of experience on intention to use, we employed the Recursive Model of Organizational Innovation (Lewis-Beck, 1974). “The recursive causal model can provide a more satisfactory evaluation than the ordinary correlation and regression techniques commonly used. The interpretation of an independent variable’s impact derived from a path model is generally more adequate because it is able to take into account the operation of indirect effects and spuriousness” (Lewis-Beck, 1974, p. 95). We used the recursive causal model to decompose the relationships between experience and the antecedents in our model and found that the total indirect effect of experience was .23. This implies that experience has a strong indirect influence on intention to use supporting hypothesis 2. Further, the magnitude of this indirect effect (.23) exceeds the direct effect (.10).

To test the moderating effects of experience on intention to use, the respondents were separated into two groups—experienced and inexperienced. A path analysis was conducted on each group and the path coefficients were compared (see columns 3 and 4 of Table 2). Paths that differ between experienced (column 3) and inexperienced (column 4) indicate strong moderating effects of experience. The criteria used to separate the respondents into an experienced (n=193) and inexperienced (n=353) group were based on self reports of actual use of e-shopping—“I use the Internet for my shopping activities very frequently (many times per week).”

<table>
<thead>
<tr>
<th>Hypothesized Relationships</th>
<th>Base Model</th>
<th>With Experience</th>
<th>Experience Subset</th>
<th>Inexperience Subset</th>
</tr>
</thead>
<tbody>
<tr>
<td>TTF to IU</td>
<td>.16**</td>
<td>.16**</td>
<td>.31**</td>
<td>.08*</td>
</tr>
<tr>
<td>SE to IU</td>
<td>.25**</td>
<td>.24**</td>
<td>.16**</td>
<td>.30**</td>
</tr>
<tr>
<td>PL to IU</td>
<td>.15**</td>
<td>.13**</td>
<td>.12**</td>
<td>.14**</td>
</tr>
<tr>
<td>PU to IU</td>
<td>.48**</td>
<td>.42**</td>
<td>.41**</td>
<td>.43**</td>
</tr>
<tr>
<td>PEU to IU</td>
<td>.02</td>
<td>.03</td>
<td>.08*</td>
<td>.01</td>
</tr>
<tr>
<td>TTF to PU</td>
<td>.35**</td>
<td>.33**</td>
<td>.43**</td>
<td>.29**</td>
</tr>
<tr>
<td>SE to PU</td>
<td>.38**</td>
<td>.32**</td>
<td>.30**</td>
<td>.36**</td>
</tr>
<tr>
<td>PL to PU</td>
<td>.26**</td>
<td>.20**</td>
<td>.09*</td>
<td>.27**</td>
</tr>
<tr>
<td>Sex to PU</td>
<td>-.16**</td>
<td>-.09*</td>
<td>-.07*</td>
<td>-.10*</td>
</tr>
<tr>
<td>Exp to TTF</td>
<td>.12**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exp to SE</td>
<td>.35**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exp to PL</td>
<td>.33**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exp to PU</td>
<td>.19**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exp to PEU</td>
<td>.01</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exp to Sex</td>
<td>-.07*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exp to IU</td>
<td>.10**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variance explained (r²) for IU</td>
<td>.70</td>
<td>.66</td>
<td>.58</td>
<td>.67</td>
</tr>
<tr>
<td>Respondent size</td>
<td>546</td>
<td>546</td>
<td>193</td>
<td>353</td>
</tr>
</tbody>
</table>

** p < .01  * p < .05

Table 2. Covariance Structure Analysis of Relationships

DISCUSSION AND CONCLUSION

The purpose of this study was to examine the role of experience on e-shopping. This was accomplished by testing a modified TAM model for direct, indirect, and moderating effects of experience. This study found that experience has a significant direct effect on intention to e-shop which suggests that e-shopping appears to become a habit. But unlike other studies, we found that the indirect effects of experience on intention to e-shop are stronger than the direct effects. In other words, the direct effect of habit is less than the indirect effects of experience. These indirect effects are made clear when moderating effects are evaluated.
One moderating effect is that experience increases the role of PEU and TTF on intention to e-shop while decreasing the role of Self Efficacy. This may imply that as e-shoppers gain experience, the ease and the fit of the task is more important as practice may permit better assessments of the difficulty of the e-shopping task, and the ease and fit aspects of the site. More inexperienced e-shoppers on the other hand may be more concerned with their self efficacy. That is, do they think they can successfully handle e-shopping activities? As e-shoppers gain experience the significance of self efficacy becomes less important than assessments about the characteristics of the site for the task or the ease of use of that site. Much like decision makers in other contexts, experienced e-shoppers may grow in their ability to classify shopping experiences, solve problems, find relevant information, and mentally represent the shopping process which leads to a better understanding of fit and ease characteristics. This awareness of fit and ease may make experienced e-shoppers more responsive to variations in fit and ease at different sites.

It is also interesting to note the moderating effects of experience on playfulness. While there is little change between inexperienced and experienced shoppers on the relationship between playfulness and intention, there is a much greater impact of playfulness on PU among inexperienced shoppers than experienced shoppers. In other words, among inexperienced shoppers playfulness and usefulness are closely linked. Perhaps inexperienced users can assess playfulness and find it important or similar to usefulness; whereas experienced decision makers can separate playfulness and usefulness.

The findings in this study are unique in at least two ways. First, this is the only study in technology adoption that found a smaller direct effect for experience than indirect effects. This may be due to the choice of antecedents to intention to e-shop in the modified TAM model used in this study. Other studies have employed different variables, and therefore may have missed important indirect effects of experience. The second unique aspect is the accuracy of this model. Although the goal of the paper is to assess experience and not to suggest a modified TAM, our model explains 70% of the variance in intention to e-shop, the highest degree of explained variance for intention to e-shop in all technology adoption studies. Other similar studies of e-commerce using TAM type models explained less of the variance in intention to shop--43% (Taylor and Todd, 1995), 63% (Dishaw and Strong), and 62% (Gefen, Karahanna & Straub, 2003).

There are several limitations to this study. First, self-reports are used to measure actual use. Self-reports may create self-generated validity and thus inflated causal linkages (Feldman and Lynch, 1988, Taylor and Todd, 1995). Second is the ability to generalize. Our narrow demographic sample may generate results not applicable to users in other age groups. However, our narrow demographic sample did vary in web experience and frequency of e-shopping activities (See Methodology). Another limitation is not controlling for sites visited by respondents. The factors that lead to e-shopping and the effects of experience may well differ based on the types of sites consumers have visited.

These exploratory and preliminary results suggest further study. A first step would be to evaluate these hypotheses with a different population. Equally important would be the ability to trace actual e-shopping activities rather than use self reports of intention to e-shop. Another direction would be to assess how experience changes the cognitive processes used by experienced e-shoppers--what different information on the website is sampled, do they reason and conclude with less information, and do they plan or make use of feedback differently from inexperienced users.

The results here suggest e-commerce sites might well be served to take experience into account. It appears that habit leads e-shoppers to continue to shop, but that other factors are influenced by experience as well, and these influences in turn affect future intentions to e-shop. As a result, sites should be designed for inexperienced users that address their self efficacy concerns about conducting the transaction. For inexperienced users, sites should also emphasize playfulness and be less concerned about ease of use or task fit. When experienced shoppers visit the site, task fit and ease of use should be apparent to the user, and the playfulness features reduced. In summary as e-shopping matures e-commerce sites will be well served to identify the experience level of their shoppers and tailoring their sites accordingly.

REFERENCES


Appendix
The variables measuring the constructs were formed from the following items. Unless otherwise noted, these items measured the constructs by asking individuals to agree or disagree with statements using a Likert scale of 1 – 5 with end points of “strongly agree” and “strongly disagree.”

**Perceived Usefulness**
1. Using the Internet enables me to accomplish my shopping activities (to buy a product or browsing for product information) more quickly.
2. Using the Internet makes it easier for me to shop.
3. Overall, I find the Internet useful for my shopping activities.

**Perceived Ease of Use**
4. It is difficult to learn how to use the Internet to do my shopping activities.

**Intention to Use**
5. In my opinion it would be very desirable to use the Internet for my shopping activities.
6. Using the Internet for my shopping activities is a good idea.
7. Overall, I like using the Internet for my shopping activities.

**Actual Use**
8. I use the Internet for my shopping activities very frequently (many times per week).

**Task-Technology Fit**
9. Sufficiently detailed product information is maintained on product websites.
10. On the websites I visit, product information is either obvious or easy to find out.
11. I can get product information quickly and easily from a website when I need it.
12. The online product information that I use is accurate enough for my purposes.
13. The online product information is up to date enough for my purposes.
14. The online product information that I need is displayed in a readable and understandable form.
15. The online product information maintained at websites is what I need to carry out my shopping activities.

**Playfulness**
16. Based on my previous experiences, I have fun using the Internet for my shopping activities.

**Self Efficacy**
17. I am comfortable using the Internet for my shopping activities.

Demographic Information
18. What is your current educational level (Choose only one)?
   A. Freshman
   B. Sophomore
   C. Junior
   D. Senior
   E. Master and/or Ph.D.

19. What is your age range (Choose only one)?
   A. Under 20
   B. 20 – 25
   C. 26 – 30
   D. 31 – 40
   E. over 40

20. Your gender is (Choose only one):
   A. Male
   B. Female