Practice Makes a Difference: Experience and E-Commerce

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As demonstrated in e-commerce literature, the technology acceptance model (TAM) has been used extensively to measure intention to adopt specific technologies (Gefen, 2003; Lee, 2002; Moon & Kim, 2001).   E-commerce is fast a maturing industry, and many consumers have moved beyond the adoption phase modeled explicitly in the TAM and have become experienced consumers. This study examines the role of experience on consumers' intentions to shop online. As hypothesized, experience has both direct and indirect effects on intention to use e-commerce, and there are moderating effects on the antecedents—perceived usefulness, playfulness, and self efficacy—to intention to use e-commerce.

In the United States, e-commerce is expected to approach $200 billion in 2006 for online retail sales (Mulpuru, Temkin, & Steinberg, 2006). Half of all Internet users now obtain product information from the web prior to purchasing goods and services, and 33% of revenues in North American firms are attributable to e-commerce (Ward & Sipior, 2004). The Census Bureau of the Department of Commerce reported that e-commerce sales for the fourth quarter of 2004 had a 22% increase over the same quarter in 2003 (Kerner, 2005). E-commerce has transformed the relationship between businesses and consumers. To build on-going relationships with consumers, online businesses must understand the factors that contribute to customer satisfaction and repeated purchases (Lee, Pi, Kwok, & Huynh, 2003; Shim, Shin, & Nottingham, 2002).

With the explosive growth of e-commerce, research that examines the relationship of experience to consumers' intention to shop online is warranted. Experience has been shown to be a determining factor of behavior, and behavior leads to intention (Ajzen & Fishbein, 1980; Taylor & Todd, 1995; Triandis, 1971).

The objective of this research is to examine the effects of experience on e-commerce activities. Experience may be considered a direct effect or an indirect effect influencing the factors that affect e-commerce. The factors that have been shown to affect intention to shop online include self efficacy, playfulness, and the fit between task and technology (Cheung, Chang, & Lai, 2000; Moon & Kim, 2001; Torkzadeh & Van Dyke, 2002). This research also compares the relative effects of e-commerce shopping experience, retail shopping experience, catalog shopping experience, and technical experience. In other studies, these related experiences—catalog shopping, retail shopping, and technical experiences—are shown as important determinants of behavior and therefore of intent (Bellman, Lohse, & Johnson, 1999; Ward, 2001). This study examines whether any of these related experiences are as significant in e-commerce shopping as the actual online shopping experience. In summary, the current study contributes to the field of e-commerce adoption by showing the expected and unexpected impact of various types of experience on the intention to shop online. This research also shows that the most profound effect on actual experience is through the task-technology fit construct.

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The remainder of this paper is organized by presenting literature on the effects of experience on intention and the relationship between experience and e-commerce adoption modeled by the TAM, followed by the hypotheses, research methodology, and results. The paper finishes with a discussion and implications section followed by conclusions.

The Effects of Experience

Psychologists have researched belief, attitude, intention, and behavior extensively as they relate to predicting future behavior and decision making (Feldman & Lynch, 1988; Shanteau, 1992; Sheppard, Hartwick, & Warshaw, 1988). Intention to shop online is a decision. To understand better the effects of experience on that judgment, this research reviews the expert decision making literature as it applies to e-commerce shopping activities.

In general, decision making is defined as "the acts or options among which one must choose, the possible outcomes of these acts, and the contingencies or conditional probabilities that relate outcomes to acts" (Tversky & Kahneman, 1981, p. 453). Individuals learn and adapt behaviors and gain perspectives from the repetition or practice of buying online. By using feedback from previous experiences and trials, individuals adapt their cognitive processes as well as their performance. Individuals 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).

Experience has been shown to improve decision making greatly in a wide range of decision settings (Ericsson, 1998; Richman, Gobet, Staszewski, & Simon, 1996). There are a number of advantages for the experienced individual: 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). Another advantage is forward reasoning. Practiced decision makers reason from symptoms to hypotheses, whereas 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 the development of a long term memory that is richer and more organized, and leads to more effective use of short term memory (Ericsson, 1998; Richman et al., 1996). More generally, experience results in significant changes to an individual's representation of a domain that permits enhanced planning, modification, reasoning, monitoring, and feedback (Ericsson, 1998). More experienced individuals classify events within these schemata based on principles using deep cues of the nature of the problem. This contrasts with those with less experience, who are thought to use more superficial features (Chi, Glaser, & Farr, 1988; Orasanu & Connolly, 1993; Prietula & Simon, 1989). In summary, experience changes the individual's behavior and assessment of the task.

Experience may also lead to habits. Behaviors that are repeated may be identified as habits. Triandis (1971) described habit as "an established repertory of reactions to a given category of attitude objects" (p. 5). In other words, once the object has been classified, previous experience is used to shape or guide behavioral responses independent of any cognitive decision making. Once experience has been gained, behavioral intentions may be influenced by the experience (Gefen, 2003; Limayem & Hirt, 2003). Limayem and Hirt (2003) refer to habit as automatic, non-deliberate, frequent repetitions that may explain intention. As shown in a number of studies, experience or habit has a significant impact on intention (Gefen, 2003; Limayem & Hirt, 2003; Taylor & Todd, 1995).

The extensive research in the field of judgment and decision making clearly suggests that the effects of experience on task are considerable. The adage "practice makes perfect," however, has been shown to be quite

limited to the specific practice of a particular task (Richman et al., 1996). In other words, the positive effects of experience are only obtained if the individual is performing a narrowly defined, well-practiced task. Change the task even slightly from the practiced task and expert performance approaches novice levels (Ericsson, 1998). Although it would seem reasonable to expect some carry over benefit from practicing related tasks, studies show that the benefits of these other experiences are surprisingly small compared to actual experience (Shanteau, 1992).

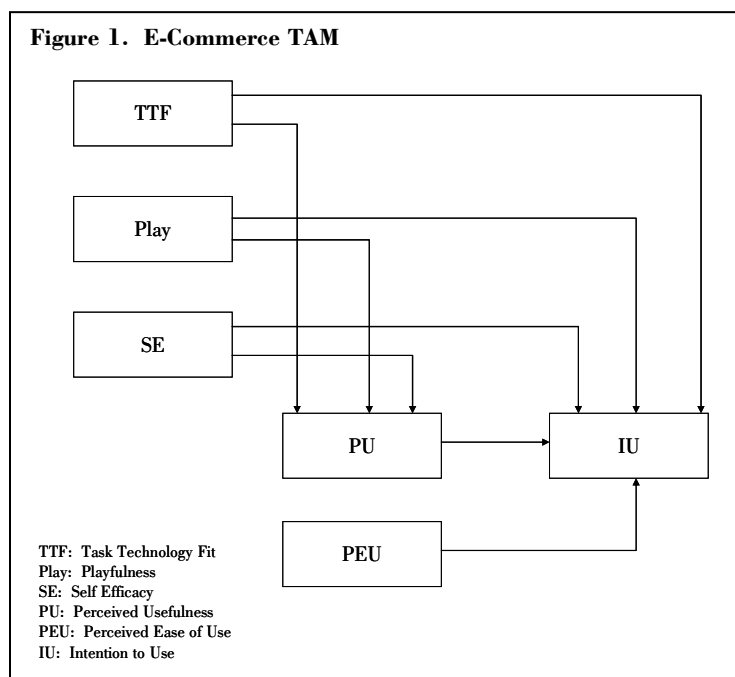## Experience and E-Commerce Adoption Using the TAM

Experience was not a factor in the original technology acceptance model. While the TAM has been used extensively to model e-commerce shopping activities (Gefen, 2003; Lee, 2002; Moon & Kim, 2001), the effect of experience on e-commerce shopping using the TAM has been examined in only a few of these studies (Gefen, 2003; Limayem & Hirt, 2003; Venkatesh, Morris, Davis, & Davis, 2003). A more recent general technology acceptance model, the Unified Theory of Acceptance and Use of Technology (UTAUT), has suggested that experience does not have a direct or indirect effect on intention to use a technology. Instead, experience only moderates some of the effects of the antecedents of intention to use a technology (Venkatesh et al., 2003).

The UTAUT study did not limit itself to e-commerce adoption; more importantly for studies of experience, the UTAUT study omits important task characteristics such as the fit between task and technology. One key contribution of the present study is to highlight the importance of task when considering the effects of experience on e-commerce shopping.

Model Development

A necessary step to examine the effects of experience on intention to shop online is to determine a baseline model of

e-commerce shopping without the experience variable. Once the baseline model is established, experience can be added and the changes measured. We constructed the baseline model using the TAM (see Figure 1) as its foundation with some adjustments that are common to other technology adoption studies (Agarwal & Prasad, 1998; Venkatesh, Morris, & Ackerman, 2000). We further modified the model by removing the relatively weak relationship between perceived usefulness (PU) and perceived ease of use (PEU) as was done in other studies (Childers, Carr, Peck, & Carson, 2001; Lederer, Maupin, Sena, & Zhuang, 2000). The model features other constructs that have been shown to be important in e-commerce adoption. Self efficacy (SE), playfulness (Play), and task technology fit (TTF), have been added as antecedents to intention to use (IU) (Cheung et al., 2000; Moon & Kim, 2001; Torkzadeh & Van Dyke, 2002). Self efficacy measures a feeling of self competence (Salanova, Grau, Cifre, & Llorens, 2000), and playfulness is an assessment of perceived enjoyment (Childers et al., 2001; Teo, Lim, & Lai, 1999). Task technology fit (TTF) is defined as how well the new technology fits the requirements of a particular task (Dishaw & Strong, 1999). In other words, a technology will

Figure 1. E-Commerce TAM

TTF: Task Technology Fit
Play: Playfulness
SE: Self Efficacy
PU: Perceived Usefulness
PEU: Perceived Ease of Use
IU: Intention to Use

be adopted if it is a good fit with the task it supports (Goodhue & Thompson, 1995).

Previous researchers have modeled experience in different ways. Taylor and Todd (1995) modified the TAM model to include subjective norm and social influences as determinants of behavioral intention and showed that experience did affect behavioral intention, perceived usefulness, and perceived ease of use. Gefen described experience as habit and, using the TAM, hypothesized that "habit was a significant predictor of the future use of the IT" (2003, p. 2). Limayen and Hirt (2003) added social factors and facilitating conditions to their model, which was based on Triandis's (1971) framework, to show that experience directly influences behavioral intentions.

In this research, we model experience by adding it in the model as another factor that leads directly to the intention of e-commerce shopping (IU). We model experience as an indirect effect on the intention of e-commerce shopping; that is, experience influences intention of e-commerce shopping via other factors such as perceived usefulness or playfulness. We treat experience as a construct that moderates or changes the factors that lead to the intention of e-commerce shopping. Factors in the TAM model would have different effects for experienced and inexperienced e-commerce shoppers.

Hypotheses

Direct, Indirect, and Moderating Effects of Actual E-Commerce Shopping Experience on Intention

A number of studies have shown that e-commerce experience has had a positive direct effect on the future intention of e-commerce shopping (Dishaw & Strong, 1999; Gefen, 2003; Liao & Cheung, 2001). One goal of this study is to evaluate if prior e-commerce shopping experience is directly related to the intention to shop online. People who shop online have developed the habit or routine of e-commerce shopping and will continue to do so without much reflection or rational analysis about the task. As was shown by Gefen (2003), habit has a direct effect on e-commerce

shoppers who continued to use a particular website. Our study broadens the domain of e-commerce shoppers' habits or experiences beyond one website to e-commerce shopping in general. Not only should experience increase the likelihood of subsequent e-commerce shopping, but experienced shoppers, like experienced decision makers, have planning, reasoning, and classification advantages that should improve their e-commerce shopping decision making and, therefore, encourage subsequent e-commerce shopping activities. Accordingly, we propose the following hypothesis:

H1a: Actual e-commerce shopping experience has a positive direct effect on future intention to shop online.

In addition to direct effects, this study proposes that experience will impact the intention of e-commerce shopping in an indirect manner (see Figure 2). These indirect effects may be more important to the subsequent intention of e-commerce shopping than the direct effect. Previous non e-commerce TAM research has shown that experience exerts an indirect effect on intention through perceived usefulness and perceived ease of use (Venkatesh et al., 2000). Within the e-commerce shopping domain, Gefen (2003) also found a significant indirect effect through both perceived usefulness and perceived ease of use. By including additional factors that were not included in TAM such as task-technology fit, self efficacy, and playfulness, the indirect effect of experience on intention to shop online will be much more pronounced. Therefore, we propose the following hypothesis:

H1b: The indirect effects of actual e-commerce shopping experience have a stronger impact on intention to shop online than the direct effect.
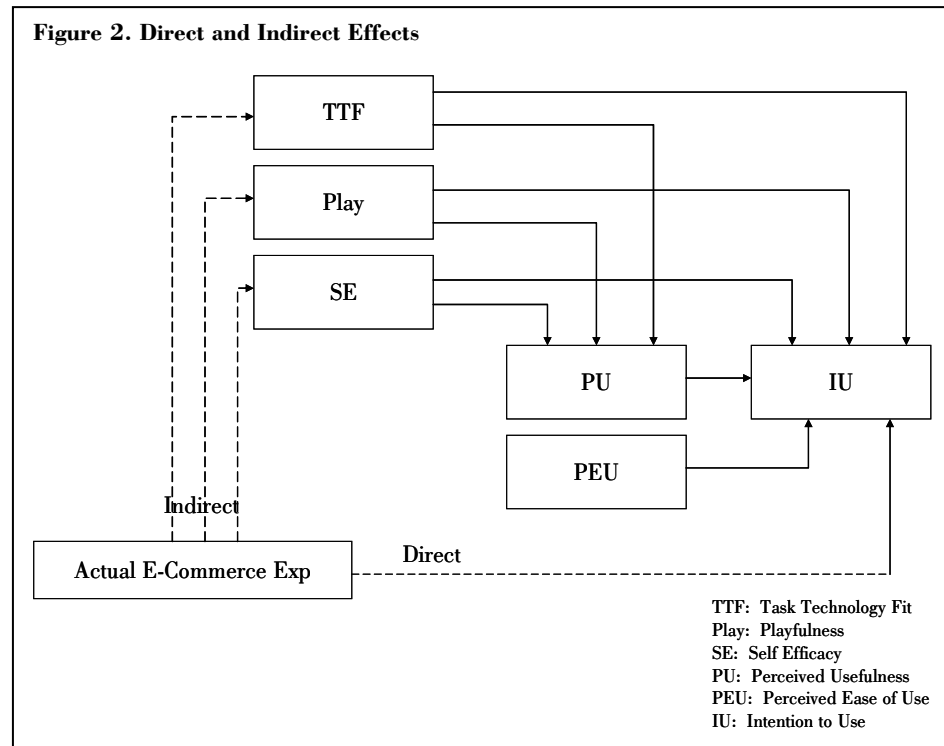
Over 10 years ago, Thompson, Higgins, and Howell (1994) suggested that the moderating influences of experience on office software adoption were very significant. Since that time, the only studies of technology adoption that have tested the moderating effects of experience have been concerned with technology adoption in

general and not with the e-commerce domain specifically. In one study, Taylor and Todd (1995) concluded that perceived usefulness is a more important construct for inexperienced adopters than for experienced adopters. In another study, Venkatesh, Speier, and Morris (2002) suggested that experience combined with gender has a moderating effect on the relationship between subjective norms and intention. The UTAUT study (Venkatesh et al., 2003) found that experience moderates effort expectancy, similar to perceived ease of use in the TAM, and moderates the effect of social influence on the intention to adopt. 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. Therefore, we propose the following hypothesis:

H1c: Actual e-commerce shopping experience has significant moderating effects on the intention to shop online.

Experience and Task Effects

Just like decision makers in other contexts, as e-commerce shoppers become more experienced, they develop a much better understanding of the task. They improve their knowledge of which cues to sample, they recall advantages, and they exhibit an enhanced ability to match problems and solutions (Richman et al., 1996). More experience leads to a better understanding of the e-commerce shopping task, thereby enabling experienced shoppers to assess task and

Figure 2. Direct and Indirect Effects

TTF: Task Technology Fit
Play: Playfulness
SE: Self Efficacy
PU: Perceived Usefulness
PEU: Perceived Ease of Use
IU: Intention to Use

technology fit better. Inexperienced shoppers may be blind to the importance of task fit, as they have not yet encountered the consequences of a poor task fit situation. Another goal of this research is to explain the effect of experience on the task of shopping online. As previously mentioned, practice and repetition make a difference in experience, and actual experience significantly changes the behavior and intention of e-commerce shoppers. Repeated practice of the e-commerce shopping task can lead to changes in e-commerce shoppers' understanding of the task. As actual experience increases, e-commerce shoppers' assessments of the online shopping task and the technology that supports it must become more sophisticated and more accurate. Therefore, we expect that experience will moderate task-technology fit.

Other antecedents of the e-commerce shopping task such as self efficacy, playfulness, and perceived usefulness have also been shown to be affected by experience (Venkatesh et al., 2003). If experience and task are as tightly linked as suggested earlier, we expect that experience with e-commerce shopping will have a greater impact on task-technology fit than any of the other

non-task antecedents of intention such as perceived usefulness, playfulness, or self efficacy. Accordingly, we propose the following hypothesis:

H2a: The moderating effect of actual e-commerce shopping experience on the intention to shop online is stronger for task-technology fit than for playfulness or self efficacy.

As mentioned earlier, the effect of experience is closely associated with a specific task. In other words, the impact of experience on behavior will only be obtained if the observed task is nearly identical to the practiced task. Therefore, we expect that the total effect of the actual e-commerce shopping experience, including direct and indirect effects, is to be much greater than the total effect of any measure of related experience.

Previous e-commerce studies have suggested that among e-commerce shoppers other related experiences might include retail shopping (Jarvenpaa & Todd, 1997), catalog shopping (Crisp, Jarvenpaa, & Todd, 1997) and experience with technology (Bellman et al., 1999; Crisp et al., 1997). In these studies, related experiences have had significant impacts on e-commerce. While it is reasonable to expect carry over benefits from the related experiences, these impacts are typically less significant than the actual e-commerce experience. Accordingly, we propose the following hypothesis:

H2b: The combined direct and indirect effects of related e-commerce shopping experiences (retail, catalog, or technology) are much less significant than the combined direct and indirect effects of actual e-commerce shopping experience.

Method

We examined these hypotheses in the context of e-commerce shopping activities. To examine the effects of experience on intention to shop online, we administered a survey to undergraduate students at a university in the Midwest. We describe the procedures, respondents, instrument development, and data analysis procedures 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, Bruce, & Hill, 1998; PRNewswire, 2000; Yoo & Donthu, 2001). We obtained permission from instructors to enter their classrooms, explain the purpose of the study, and ask for volunteers. Respondents were given a random user ID and password to retrieve the questionnaire from a website where they were authenticated based on their user ID prior to accessing the questionnaire. The questionnaire consisted of 17 items plus three questions to gather demographic information and took approximately 10 minutes to complete. Of the 826 students solicited, 546 participated, providing a response rate of 66%. Fifty-six percent were male and 44% were female. Most of the respondents (77%) were between 20 and 25 years of age. The majority of respondents were juniors (37%) and sophomores (34%). Because of the homogenous nature of these respondents, we did no follow up for non-response bias.

Instrument Development

We pilot tested the initial version of the instrument with 88 volunteers from marketing courses other than those used for the research project. Based on the feedback received from the pilot test, we reworded or deleted questions. We adapted the scales used to measure perceived usefulness and intention to use from Davis' research (1989), and the scales used to measure task-technology fit were adapted from Goodhue and Thompson (1995). We measured experience by asking how frequently, or how many times a week, the respondents engaged in online shopping activities. We measured all items with a five-point Likert scale with end points of "strongly agree" and "strongly disagree." We used Cronbach's alpha to measure the internal consistency of the

Table 1. Descriptive Statistics and Cronbach's Alpha

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

individual scales. The tests for internal consistency were satisfactory (see Table 1).

Data Analysis

We analyzed the data with confirmatory factor analysis 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). Path analysis is a multivariate analytical methodology for empirically examining sets of relationships in the form of linear causal models (Duncan, 1986). This procedure is consistent with the methodology used by others in similar studies (Dishaw & Strong, 1999; Teo et al., 1999). In addition, we used confidence intervals to demonstrate significant differences in path relationships.

Results

We tested the hypotheses using path analysis, and four of the five hypotheses were supported. The results of the analysis are summarized in Table 2.

The model fit was well within acceptable thresholds ($\chi^2 = .38$, df = 1, $\chi^2/df = .38$, p = 0.54, AGFI = 0.995), and there was a particularly strong prediction of the intention of e-commerce shopping ($r^2 = .70$).

For comparative purposes, we fit the base model to the data. The results of this base model analysis are displayed in the second column of Table 2 identified as "Base Model (no Experience)." The first 5 rows following the label "Relationships" identify the coefficients with IU, and the next three rows show the coefficients with PU. To evaluate direct and indirect effects, we added a path from actual experience to intention to use and paths linking experience to each of the antecedents. These results are shown in the section labeled "Indirect Effects" and are presented in the lower half of the third column of Table 2 and in Figure 3. The direct relationship between actual experience and intention to use was significant (path coefficient = .10; t = 4.3; p < .01) thus supporting hypothesis 1a.

In order to ascertain the total indirect effect of actual experience on intention to use, we used the recursive model of organizational innovation (Lewis-Beck, 1974). Thompson et al. (1994) used a similar procedure in determining the indirect effects for a conceptual model of utilization. We used the recursive causal model to decompose the relationships between experience and the antecedents in this study. The procedure yielded the total indirect effect of experience as .23, implying a strong indirect influence on intention to use, supporting hypothesis 1b. The magnitude of this indirect effect (.23) well exceeds the direct effect (.10).

To test the moderating effects of actual experience on intention to use, we separated the respondents into two groups, experienced (n = 193) and inexperienced (n = 353), based on self-reports of actual use of e-commerce shopping. We conducted path analyses for both groups and compared the path coefficients (see columns 4 and 5 of Table 2, labeled "Experienced Subset" and "Inexperienced Subset"). Overall, the paths were not statistically significantly different, based on an examination of the confidence intervals, but the direction of the differences suggests that there may be moderating effects of experience.

Hypothesis 1c is not statistically supported, but there appears to be a trend in the positive direction.

Hypothesis 2a compared the influence of task-technology fit, playfulness, and self efficacy on intention to shop online for experienced and inexperienced shoppers. The 95% confidence interval for the path from task-technology fit (TTF) to the intention to use (IU) did not show a significant difference between the two groups, but

it was significant at the 90% confidence level. There is a moderating effect of experience on this relationship, suggesting that, as e-commerce shoppers gain experience, the role of task-technology fit increases. As proposed in hypothesis 2a, experience influences playfulness and self efficacy less. A confidence interval analysis did not show a significant difference between experienced and inexperienced users in the paths from playfulness (Play) and self efficacy

Table 2. Covariance Structure Analysis of Relationships

|	Base Model (no experience)	With Actual Experience (n=546)	Actual Experience Subset (n=193)	Actual Inexperience Subset (n=353)	Related Experience		
					Retail	Catalog	Tech
Relationships							
TTF to IU	.16**	.16**	.31**	.08*	.16**	.17**	.16**
SE to IU	.25**	.24**	.16**	.30**	.25**	.25**	.25**
Play to IU	.15**	.13**	.12**	.14**	.15**	.15**	.14**
PU to IU	.48**	.42**	.41**	.43**	.41**	.47**	.47**
PEU to IU	.02	.03	.08*	-.01	.01	.02	.02
TTF to PU	.34**	.32**	.44**	.28**	.34**	.36**	.34**
SE to PU	.39**	.32**	.30**	.36**	.39**	.37**	.39**
Play to PU	.26**	.20**	.08*	.26**	.26**	.25**	.24**
Indirect effects							
Exp to TTF		.12**			.02	.01	-.01
Exp to SE		.34**			.03	-.15**	-.05*
Exp to Play		.33**			.07*	-.13**	-.07*
Exp to PU		.20**			.00	-.11*	-.03
Exp to PEU		-.01			-.05	.06*	.04
Total indirect effects		.23			.04	.15	.05
Exp to IU (direct effect)		.10**			.00	-.05*	-.02
Variance explained (r^2) for IU	.70	.66	.58	.67	.59	.60	.60
Respondent size	546	546	193	353	546	546	546
** p < .01 * p < .05							

(SE) to intention to use (IU). There was a significant difference at the 95% confidence level, however, between experienced and inexperienced shoppers in the path from playfulness to perceived usefulness. This unexpected finding suggests that there is a stronger effect of playfulness for inexperienced shoppers. Hypothesis 2a is supported.

The final hypothesis compared the effect of actual experience and related e-commerce shopping

Figure 3. Results of Direct and Indirect Effects

TTF: Task Technology Fit
Play: Playfulness
SE: Self Efficacy
PU: Perceived Usefulness
PEU: Perceived Ease of Use
IU: Intention to Use

experiences on intention to use. The effects of related experience measures on intention to shop online are much less significant than the effects of actual e-commerce shopping experiences. The combined effect of actual e-commerce shopping experience was .33 (direct .10 and indirect .23); for retail shopping experience the combined effect was .04 (.00 direct and .04 indirect); for catalog shopping experience the combined effect was .10 (-.05 direct and .15 indirect); and for technology experience the combined effect was .03 (-.02 direct and .05 indirect). In summary, the combined effect of actual e-commerce shopping appears to be much greater than any other related e-commerce shopping experience; therefore, hypothesis 2b appears to be supported.

Discussion and Implications

This study found that actual experience has significant direct and indirect effects on the intention to shop online. However unlike similar studies, this study found that the indirect effects of actual experience on intention to e-commerce shop are much stronger than the direct effect. Indirect effects were larger for each related experience than for the direct effect of that
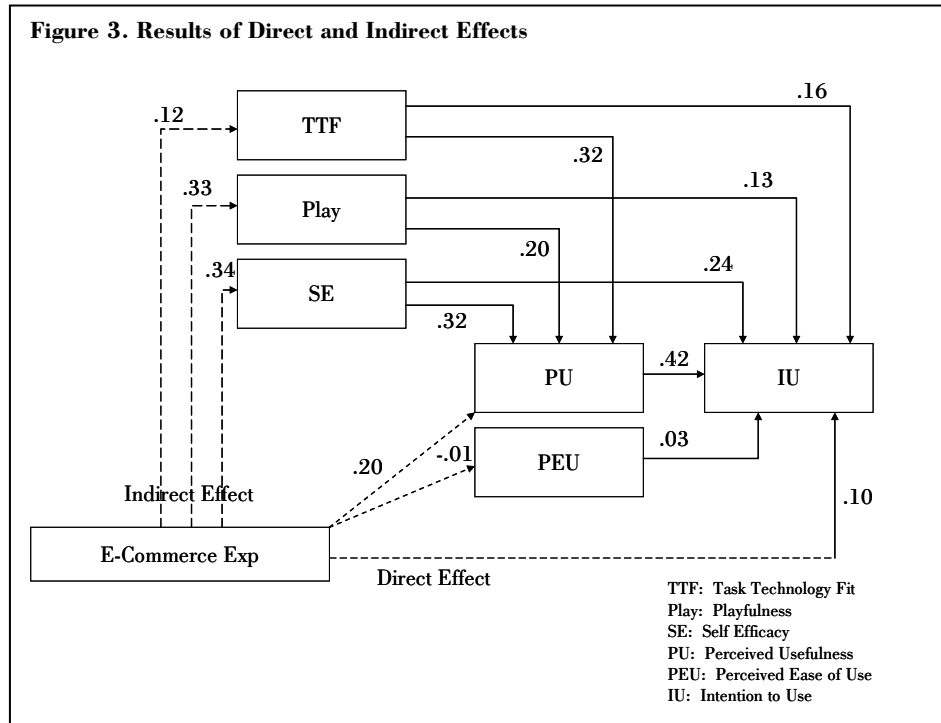
related experience on intention; in fact, for each related measure, the indirect effects are almost three times as great as the direct effect. In addition to finding strong direct and indirect effects, this study provides evidence that actual experience may be modeled as a moderating effect.

The most pronounced moderating effect of actual experience on intention to shop online is through the task-technology fit construct. This may imply that with actual experience, e-commerce shoppers can better assess the fit between the online shopping task and the technology. On the other hand, inexperienced e-commerce shoppers may be relatively more concerned with other factors such as self efficacy or playfulness. Much like decision makers in other contexts, actual experience may help e-commerce shoppers grow in their ability to classify shopping experiences, solve problems, find relevant information, and mentally represent the shopping process. As a result, they become more aware of site and browser features, limitations, risks, availability of information, and other factors that lead to assessments of how the task and the technology fit together. An implication for developers is that experienced and

inexperienced customers seem to have different factors that lead to intent to shop, and as a result, sites that cater to one group or the other should leverage those differences. While developers cannot control the experience level of e-commerce shoppers at their site, they can develop sites that include options for inexperienced shoppers to self identify and then be directed through a shopping experience that is confidence building and enjoyable. Developers might also observe novice and experienced e-commerce shoppers during site testing to notice how each type of shopper interacts with the site.

It is also interesting to look closely at the moderating effects of actual experience on playfulness. While there appears to be no difference between inexperienced and experienced e-commerce shoppers in the relationship between playfulness and intention to shop, there is a significant difference in the relationship of playfulness on perceived usefulness between inexperienced e-commerce shoppers and experienced e-commerce shoppers. In other words, among inexperienced e-commerce shoppers, playfulness and perceived usefulness appear to be closely linked. In this study, it appears that inexperienced e-commerce shoppers see playfulness as important to or similar to perceived usefulness, whereas experienced e-commerce shoppers can separate playfulness from perceived usefulness. For site developers, the implication is that for inexperienced e-commerce shoppers the site's playfulness is essential to perceptions of usefulness, while for more experienced e-commerce shoppers, the perceived usefulness of the site can be evident independent of its playfulness. Developers should structure the e-shopping experience to be clearly enjoyable for novice shoppers and structure the site to create the impression of usefulness for the experienced shopper.

The pronounced moderating effect of the task-technology fit construct suggests that experience alters the assessments of task. The importance of task in understanding experience is also evident when comparing actual task experience and related task experience. Not surprisingly, actual e-commerce shopping experience matters most, and related e-commerce

shopping experiences matter less. The combined effects of actual e-commerce shopping experiences appear to be much stronger than the combined effects of the related experiences. This finding reiterates the close relationship of experience to task that has been established over the past 15 years in the cognitive science and decision making domain (Ericsson, 1998; Tversky & Kahneman, 1981). In e-commerce research, in particular, and the TAM in general, researchers give little consideration of the task when studying experience. One notable exception is the work of Dishaw and Strong (1999) and their construct of task-technology fit.

Among the related experiences, other studies corroborate the relative ranking of the related experiences found in this study. Most find that the e-commerce shopping task is most similar to catalog shopping, followed by technology experience and then retail experience (Jarvenpaa & Todd, 1997; Ward, 2001). The close task-experience link suggests any study of e-commerce and experience must be very specific about the e-commerce shopping task and how e-commerce shopping experience is measured. In other studies the e-commerce task varies widely from general e-commerce shopping (Klopping & McKinney, 2004), shopping at one site (Limayem & Hirt, 2003), shopping for information (Pavlou, 2003), or shopping for one product (Gefen, 2003). These studies employ experience measures that are used interchangeably without considering the differences in tasks. To build a coherent picture of e-commerce, studies should be careful and deliberate about selection of the task. The e-commerce field would be well served by a more developed theory or taxonomy for the e-commerce shopping task.

The findings in this study are unique in several ways. First, this is the only study in technology adoption that found a smaller direct effect of actual experience on intention than indirect effects. This may be due to the choice of antecedents of intention to e-commerce shop in the modified e-commerce TAM model used in this study. Other studies have employed different variables, and most omit the task-technology fit construct. Therefore, the task construct may play an important role in the determination of indirect

effects of experience on task. A second unique aspect of this study shows that actual experience reduces the impact of self efficacy and playfulness on the intention to e-commerce shop, while experience raises the significance of task measures. Finally, the accuracy of this model is very high; it explains 70% of the variance in intention to e-commerce shop.

There are several limitations in this study. First, self-reports are used to measure actual use. Self-reports may create self-generated validity and therefore inflate causal linkages (Feldman & Lynch, 1988; Taylor & Todd, 1995). A second limitation is the ability to generalize. The narrow demographic sample used in this study may generate results not applicable to users in other age groups or settings. Respondents in this sample, however, did vary in their web experience and their frequency of e-commerce shopping activities.

Conclusions

The results found in this study suggest e-commerce organizations should take experience into account as they develop their web sites. In this study, experience affected self efficacy, playfulness, and usefulness. Site developers should expect that these general categories manifest themselves in related but different ways on particular sites. As a result, site testing and development should explicitly include shoppers with different experience levels. The emerging patterns of use may differ significantly, which may inform developers of important problems and preferences among e-shoppers.

It appears that actual experience directly leads e-commerce shoppers to continue to shop online. The other antecedents related to the intention to e-commerce shop, particularly the task-technology fit construct, appear to be influenced by actual experience as well. These influences in turn affect future intentions to e-commerce shop. As the public builds actual experience with e-commerce shopping, e-commerce organizations would do well to consider the many strong effects of actual experience on the intention to shop online and tailor their interactions with customers

accordingly. Most certainly, e-commerce sales will continue to grow as more and more consumers develop their experience with e-commerce shopping.

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