UNDERSTANDING CONSUMERS' ACCEPTANCE OF ONLINE PURCHASING

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ABSTRACT

This paper examines previous Technology Acceptance Model (TAM)-related studies in order to provide an expanded model that explains consumers' acceptance of online purchasing. Our model provides extensions to the original TAM by including constructs such as social influence and voluntariness; it also examines the impact of external variables including trust, privacy, risk, and e-loyalty. We surveyed consumers in the United States and Australia. Our findings suggest that our expanded model serves as a very good predictor of consumers' online purchasing behaviors. The linear regression model shows a respectable amount of variance explained for Behavioral Intention ($R^2 = .627$). Suggestions are provided for the practitioner and ideas are presented for future research.

Keywords: Technology acceptance model, Internet, behavioral intention, attitude toward using, online purchasing, e-commerce

INTRODUCTION

Each year, companies spend millions of dollars on their Websites to provide their customers with increased functionality and a more integrated marketing stream with the hopes of enticing consumers to purchase goods online. With such an investment in e-commerce it seems logical to study the acceptance by consumers of these efforts. Consumers also increasingly use the Internet to purchase goods and services. This research study describes the development of a model showing e-business acceptance by individual consumers. The purpose of this research study is to determine appropriate measures for the acceptance of online purchasing by consumers.

Businesses must adapt to the technological changes in the business world. More companies are selling over the Internet than ever before. Companies must be able to meet customers' needs, not just in bricks-and-mortar stores, but also through Internet sites. Our model and results can help businesses better understand how to meet the needs of their online customers.

This study provides managers with a framework for which areas they need to focus upon when launching new online products, such as shaping and/or changing their consumers' attitude toward using the Internet, making their Website easier to use, and enhancing the perceived usefulness of the technologies that allow consumers to access their products online.

This paper is not the first attempt at creating a model to explain or predict user acceptance of Information Technology systems. A great deal of the background research in this paper comes from the existing Technology Acceptance Model (TAM) literature. This model has been

tested repetitively though many different studies, providing support that TAM "consistently explains a substantial proportion of variance in usage intentions and behavior, among a variety of technologies" [1]. The model used in this study extends the original TAM, taking into account other factors such as Social Influence and Perceived Behavioral Control.

Our linear regression model shows an impressive amount of variance explained for Behavioral Intention (R^2 = .627). Not only are the traditional TAM variables important in predicting behavioral intention, but social influence (p<.001), perceived behavioral control (p<.001), and e-loyalty (p<.001) are all significant constructs. It seems that the model is quite robust in predicting Behavioral Intention. When limiting behavioral intention to only examine a consumer's intent to purchase from an online site, the amount of variance explained remains quite high (R^2 = .598).

We also discovered that trust, a construct not included in the original TAM, plays an important role in influencing consumers' attitudes toward purchasing.

When we limit the scope of the research to look only at consumers' Affect Towards Use (a subconstruct of Attitude Toward Using), we find that Experience Using the Internet becomes significant in predicting affect. As expected, perceived ease of use and perceived usefulness are significant in predicting both attitude toward purchasing and affect towards use.

LITERATURE REVIEW

This section reviews empirical articles which contain constructs that we will use in our research model. It is organized in chronological order, ranging from articles published in 1999 and 2000 to the most recent conference proceedings and working papers.

Lucas and Spitler [19] examined IT usage in a field setting. They extended TAM to include social norms, and other variables. In this study, social norms were more important in predicting use than other variables. They hypothesized that norms will have an effect on use as well as intended use. This hypothesis was supported through field research gathered on brokers and sales assistants of a major investment bank.

Venkatesh [27] examined user acceptance and behavior over time. He hypothesized that perceptions of external control will have an effect on perceived ease of use, and that perceived ease of use will have an effect on behavioral intention to use. He also believed that perceived usefulness will have a direct effect on behavioral intention to use. As shown in Figure 1, the results of the study showed strong support for all three of these hypotheses.
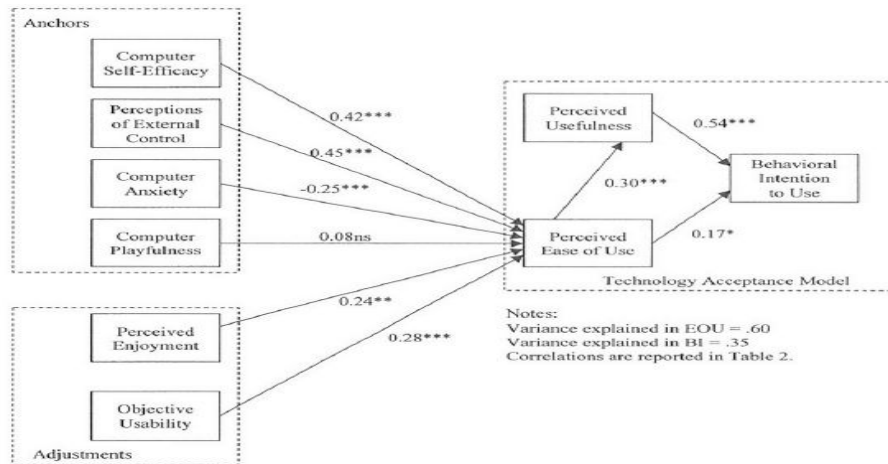

Figure 1

Chau and Hu [3] compared three models in the health care setting: TAM, the theory of planned behavior (TPB), and a decomposed theory of planned behavior (DTPB). They hypothesized that perceived usefulness will affect behavioral intention as well as attitude. It was also believed that attitude would affect behavioral intention. These hypotheses were also supported. In addition, they hypothesized that perceived behavioral control would

affect behavioral intention; this hypothesis was also supported. The belief that subjective norms will affect behavioral intention, however, was not supported in this research.

Martins and Kellermanns [21] developed a test model designed to better predict user acceptance of a web-based information system, assuming the use of the system is not voluntary. They examined both "change-enabling factors" and "change-motivating factors." Consistent with the original Technology Acceptance Model, the authors believed that perceived usefulness of the system, as well as perceived ease of use of the system, would predict attitude towards the system; both of these hypotheses were strongly supported. They also hypothesized that attitude towards the system would predict intention to use the system; this hypothesis was also strongly supported. In addition, they hypothesized that intention to use the system predicts 1) the frequency of system use, and 2) the duration of system use.

Shim et al [23] tested online information searching, and whether product information is a key element in predicting consumer purchase intentions. As shown in Figure 2, the authors expected that intention to use the Internet for product information searching will increase the intention to use the Internet for purchasing. They also hypothesized that attitude toward Internet shopping will directly predict intention to use the Internet for searching product information. Both hypotheses were strongly supported in the findings of the study. They also examined the social influence perspective by hypothesizing that a user's perceptions of "the extent to which significant referents approve of Internet use for shopping" will directly correlate to the user's intention to use the Internet for product information searching. The authors felt that pre-purchase experiences would correlate with both intentions to use the Internet for information search as well as for purchasing. Evidence from the study suggests strong support for each of these hypotheses. Lastly, the authors examined the relationship between perceived behavioral control and the intention to use the Internet for product information gathering, and found a strong correlation between the two constructs.
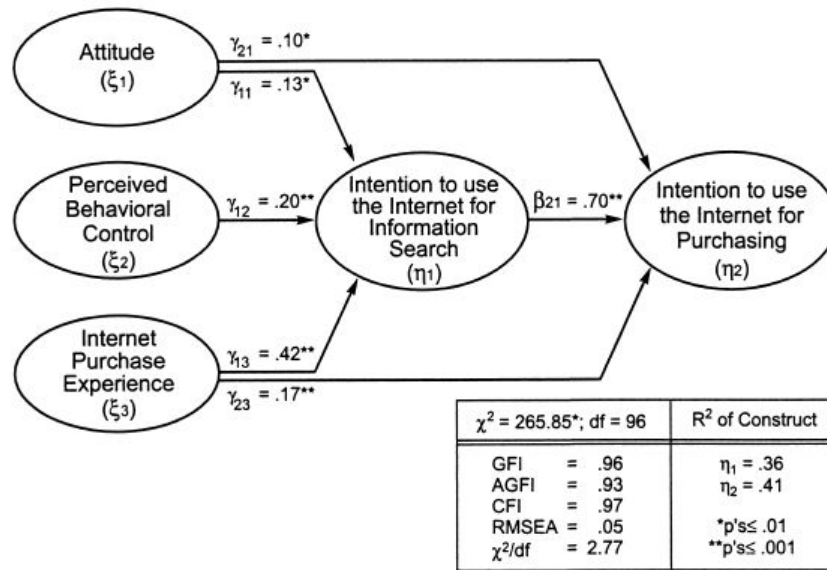

Figure 2

Dasgupta, Granger, and McGarry [7] used a courseware management tool to study the acceptance of e-collaboration technology by users. As shown in Figure 3, the authors hypothesized that perceived ease of use and perceived usefulness would have a significant effect on system usage. Both hypotheses were strongly supported in their findings. They expected use of the system to have a positive effect on individual performance, but this hypothesis was not supported in the research results.
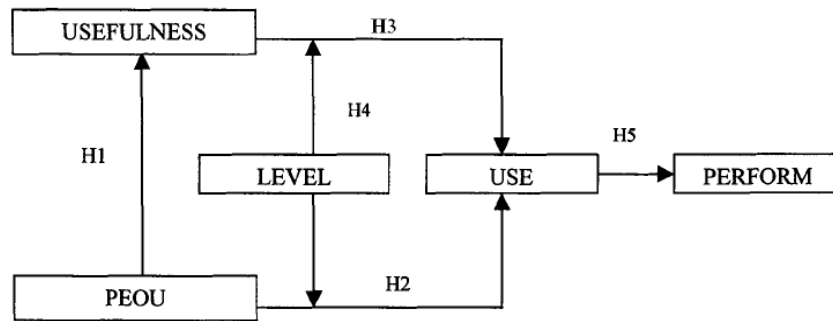
Figure 3

George [11] used the theory of planned behavior to develop a model, shown in Figure 4, for a consumer's online purchasing behavior. He found a strong correlation between the amount of experience an individual has with the Internet and the likelihood that they will purchase online. A significant correlation was also found between how trustworthy an individual finds the Internet and how positive the individual's attitude is towards online pur-

chasing. The model shows a significant positive correlation between the individual's attitude toward online purchases and the intent to make consumer purchases over the Internet; the more positive the attitude, the stronger the intent to purchase online. No significant relationship was found between an individual's beliefs surrounding the importance of online anonymity and the individual's attitude towards Internet purchasing.
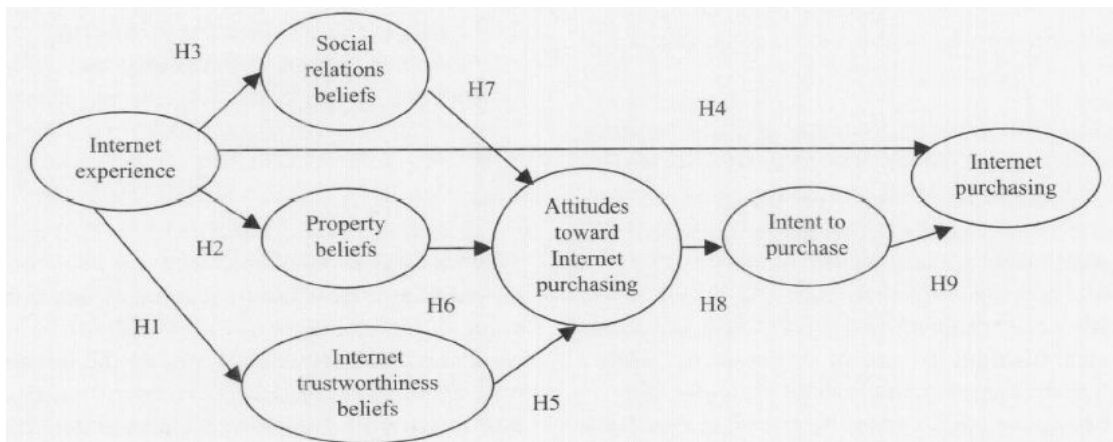

Figure 4

Mao [20] addressed the fact that IT usage is a dynamic process, and may not fit the static Technology Acceptance Model for this reason. According to Mao, this may prevent firms from developing a useful long-term management strategy. As with the original TAM model,

perceived usefulness is found to be related to attitude and to usage. Attitude is also found to have an effect on usage. However, unlike the TAM model, the hypothesis that ease of use is related to attitude was not supported in this study. Mao's model is shown in Figure 5.
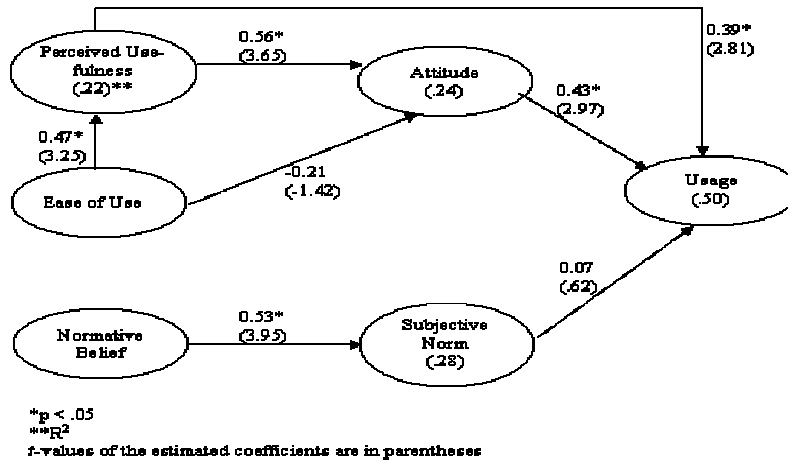
Figure 5

Singletary, Akbulut, and Houston [24] attempted to predict unanticipated use of software following mandatory adoption. Unanticipated use in their model, shown in Figure 6, refers to voluntary use of the software for other uses than mandatory adoption required, although voluntariness itself is ignored in this study. The authors hypothesized that social norms have an effect on image, as well as perceived usefulness and usage behavior. They also believe that perceived usefulness and perceived ease of use both affect usage behavior.
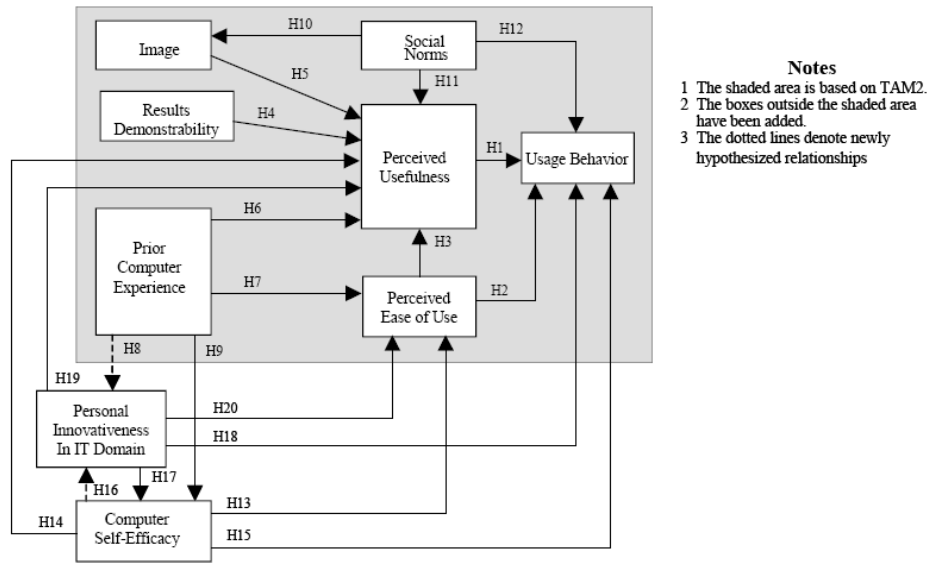
Figure 6

Hu, Clark, and Ma [15] examined the issue of high resistance to technology acceptance in public schools. They tested teachers and their acceptance of Microsoft PowerPoint. They hypothesized that depending on how useful a teacher considers PowerPoint, the more positive the effect on his or her intention to accept the technology. This turned out to be a significant finding. They also believed that "the degree to which a teacher

considers PowerPoint to be easy to use has a positive effect on his or her intention to accept the technology." However, this was not supported. The perceived subjective norm concerning the acceptance of the technology

was believed to have a positive effect on the teacher's intention to accept the technology. This was found to be a significant finding, as well. Their model is shown in Figure 7.
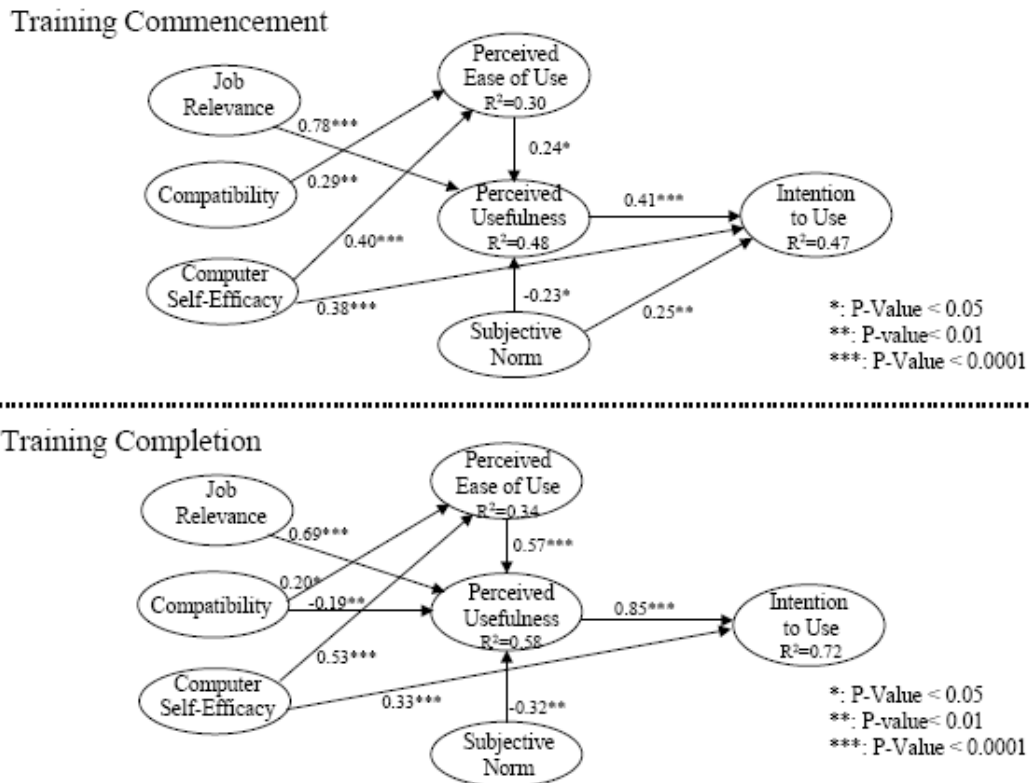

Figure 7

Gribbins, Shaw, and Gebauer [12] researched the acceptance of mobile commerce by initial users. This study differs from others as it focuses on usage by employees as opposed to usage by consumers. They found a significant relationship between perceived usefulness and attitude, whereas the relationship between perceived ease of use and attitude is not significant. Attitude towards mobile solutions was found to have an effect on behavioral intention to use. However, perceived usefulness, surprisingly, was not found to have an effect on behavioral intention to use.

Van der Heijden et al. [26] examined the factors that influence online purchase intentions of consumers. They found a strong positive correlation between attitude towards using the Internet for online purchases and behavioral intention. They also found a significant negative correlation between perceived risk and attitude towards using the Internet for online purchases. The hypothesis that trust, perceived usefulness, and perceived ease of use affect attitude towards using the Internet for online purchases proved to be significant. Their model is provided in Figure 8.
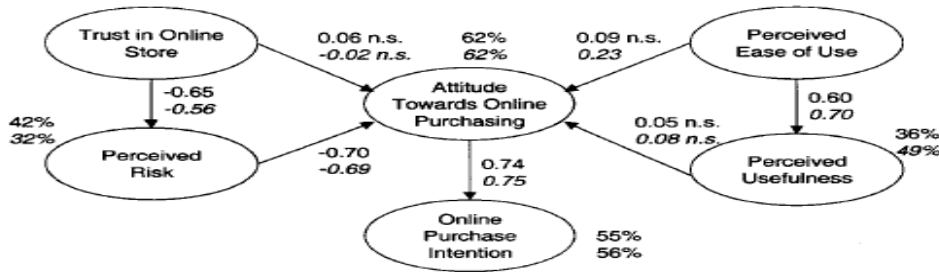
Figure 8

Yu et al. [30] revised the technology acceptance model to include "unique features of the wireless system under study." The following constructs, shown in Figure 9, were added to the TAM: individual differences, technology complexity, facilitating conditions, social influences, and wireless trust environment. The hypotheses of this study were not formally tested, so no results are given.
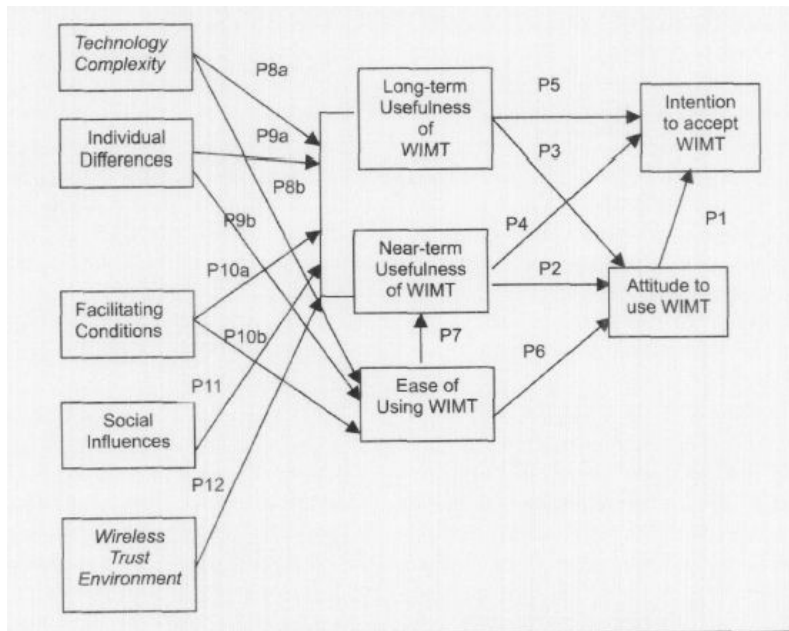
Figure 9

Venkatesh et al. [28] created a comprehensive model named the Unified Theory of Acceptance and Use of Technology (UTAUT). It is based upon eight existing models pertaining to the acceptance of Information Technology. The research studies the acceptance of personal computers, but many of the constructs apply to broader fields of information technology acceptance. No significant effect was found between facilitating conditions and behavioral intention. Likewise, computer self-efficacy, computer anxiety, and attitude towards using had no significant effect on behavioral intention. Behavioral intention, however, was found to have a direct positive influence on actual usage. The new UTAUT model, shown in Figure 10, was found to outperform the eight individual models.

Figure 10

Bhattacherjee and Prekumar [2] elaborate on the expectation-disconfirmation theory to include how users' beliefs and attitudes change during the course of t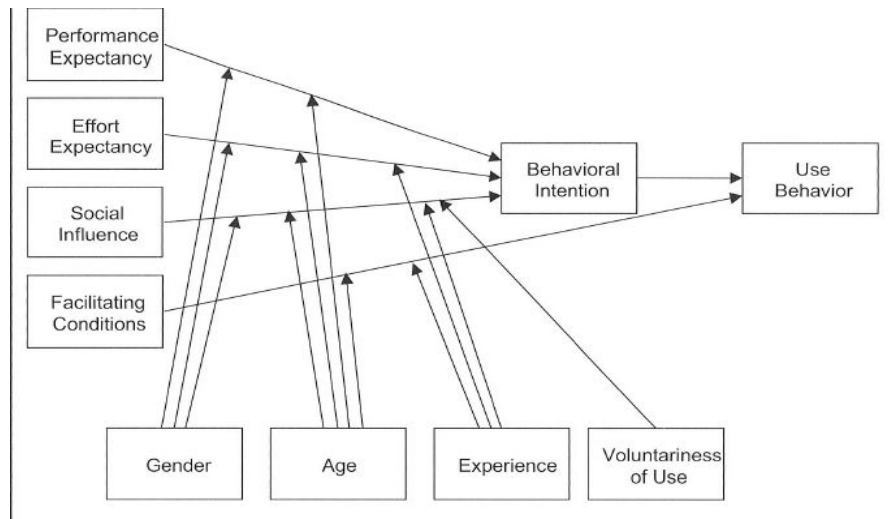heir IT usage, not just their beliefs and attitudes surrounding initial adoption of the IT. The findings of this study, displayed in Figure 11, show strong support for the hypothe-ses that usefulness has significant effects on disconfirmation, attitude, and intention to use. There is also strong support for the hypothesis that attitude has an effect on intention. Findings also show strong support for the suggestion that satisfaction has an effect on attitude.

Path significance: [a]p < .001; [b]p < .01; [c]p < .05; [ns]p > .5
Parentheses indicate R^2 values
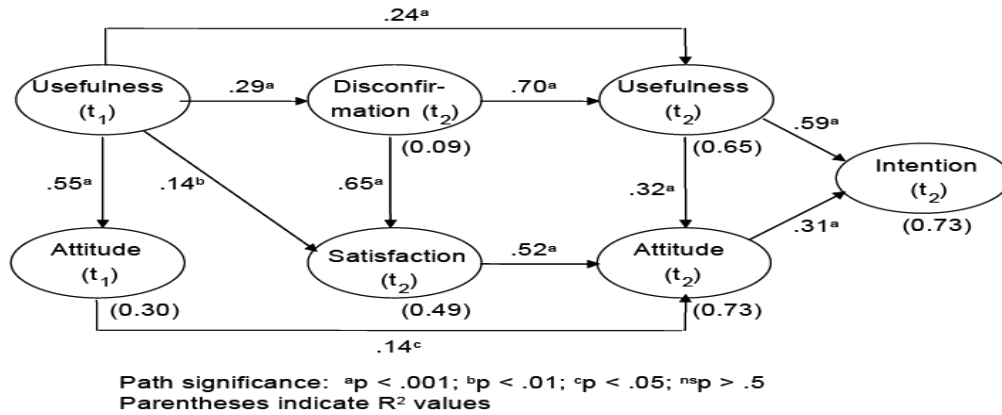
Figure 11

Kleijnen et al. [16] examined the factors surrounding the adoption of mobile services for e-commerce purposes. The following constructs, as illustrated in Figure 12, were added to the original technology acceptance model: perceived cost, system quality, and social influence. System quality and social influence were found to have a significant impact on the model. Attitude towards using mobile services was found to have a direct, positive effect on the intention to use mobile services; however, perceived usefulness was not found to have any direct effect on the intention to use. Perceived usefulness and perceived ease of use were both found to have a direct

positive effect on the attitude to using mobile services. The construct of social influence was believed to have a direct positive effect on the intention to use mobile services; the research findings support this hypothesis. It

was also suggested that as social influence is greater, the relationship between attitude and intention to use mobile services will be attenuated. The research also showed support for this suggestion.

Figure 12

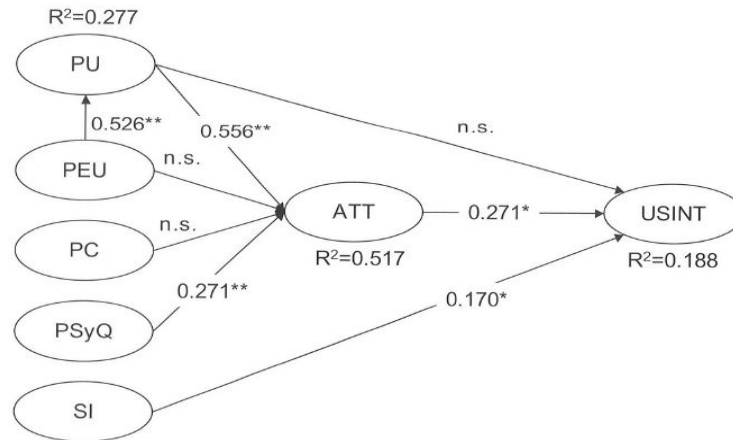Elgarah and Falaleeva [8] studied the effects of an individual's concern for privacy on the adoption of biometric technologies. Because biometrics are very personal, concern for privacy may be inhibiting to adoption. Unfortunately, this paper is a work in progress, and the results are not yet published. The authors hypothesized that perceived usefulness will positively affect intended use of biometrics. They also predicted that perceived ease of use will positively affect intended use of biometrics. They feel that concern for information privacy will have no significant effect on intention to use if the system is perceived to be mandatory, but will have a negative effect on intention to use when the system is voluntary. The

authors also hypothesize that voluntariness will moderate the effect of concern for information privacy on intentions to use.

Wilson, Mao, and Lankton [29] tested a new model shown in Figure 13 that predicts IT acceptance where use is sporadic. The new model combines the technology acceptance model with a new construct: perceived regularity of use. They hypothesized that sporadic use will reduce the level of habit formed toward use of an IT, and that sporadic use will reduce continuing use of an IT regardless of intention. The study showed significant support for each of these two hypotheses.
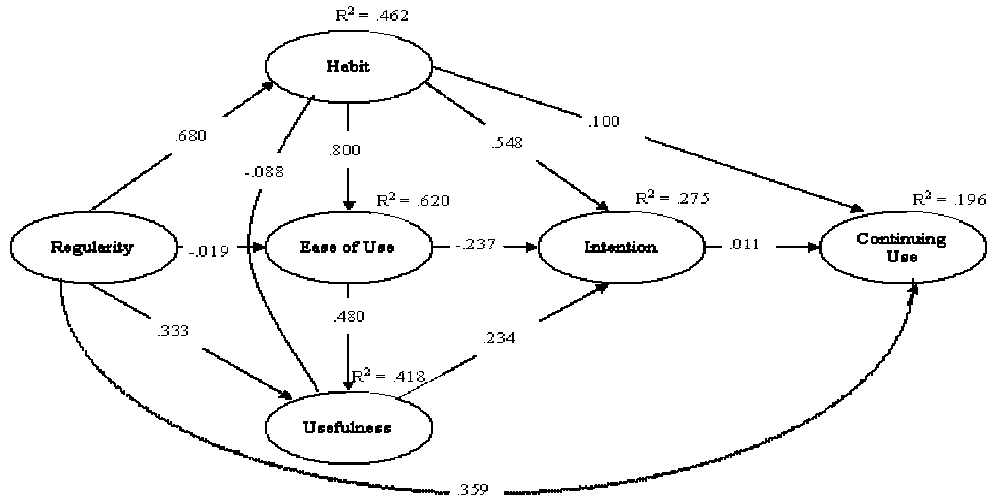
Figure 13

Amoroso and Hunsinger [1] examined the Technology Acceptance Model (TAM) and modified it, as shown in Figure 14, in order to make the model more useful in explaining the acceptance of Internet-based technologies by consumers. They hypothesized that perceived usefulness of the Internet is positively correlated to attitude toward using the Internet, behavioral intention to use the Internet, and actual usage of the Internet. A strong correlation was found between perceived usefulness of the Internet with each of these dependent variables. The relationship between attitude and behavior toward using the Internet was also hypothesized to have a strong positive correlation; this hypothesis was also supported. Actual usage was hypothesized to be affected by behavior towards using the Internet and perceived complexity of using the Internet. Each of these variables was found to have an effect on actual usage of the Internet. The hypothesis that perceived complexity of using the Internet is correlated to actual usage of the Internet was also found significant. However, voluntariness of using the Internet was not found to have a significant relationship with behavioral intention to use the Internet. Their findings suggest that a modified TAM is a better predictor of Internet-based consumer behavior.

Figure 14

RESEARCH MODEL AND HYPOTHESES

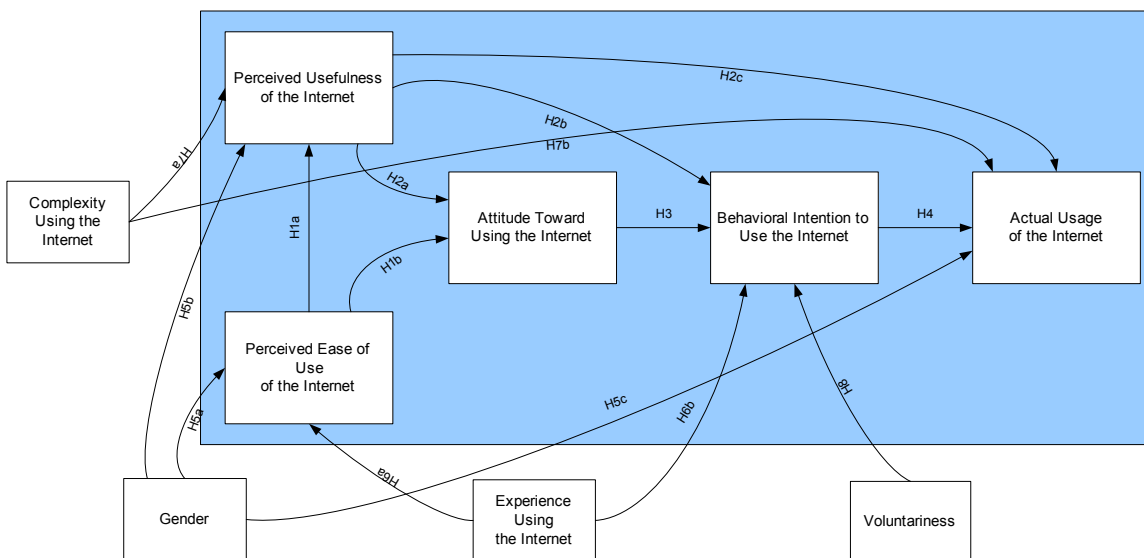## Attitude Toward Using

Attitude toward using refers to the user's feelings about using the information technology. Amoroso and Hunsinger's model [1] examined the correlation between perceived usefulness of the Internet and the user's attitude toward using the Internet (Figure 14). They hypothesized that attitude toward using the Internet is positively correlated to behavioral intention to use the Internet. The results of this study showed a strong correlation between perceived usefulness and attitude towards using, and a strong correlation between attitude toward using and behavioral intention.

Van der Heijden et al. [26] studied the acceptance of making purchases online. The model examined the relationships between attitude towards using the Internet for online purchases and trust, perceived risk, perceived usefulness, perceived ease of use, and behavioral intention. The authors hypothesized that that was a positive correlation between trust and attitude towards using, and a negative correlation between perceived risk and attitude towards using (Figure 8). The predicted correlations were strongly supported in the research. The model also predicts a positive correlation between perceived usefulness and attitude towards using, as well as a positive correlation between perceived ease of use and attitude towards using. Research showed the predicted positive correlations were supported. The model also shows a possible positive correlation between attitude toward using and behavioral intention; there was a strong positive correlation between these two constructs.

George [11] studied the intention of users to make online purchases. The model predicts that the more trustworthy a user believes the Internet to be, the more positive the user's attitude toward using (Figure 4). Also, perceived behavioral control has a direct effect on the user's attitude toward using the Internet for online purchases. Significant support was found for each of these predictions. According to the model, there is a strong positive relationship between an individual's attitude toward using and the user's behavioral intention; the research supports this prediction. The model also hypothesized a direct correlation between attitude toward using the Internet for online purchases and the user's beliefs about the privacy of the system. Research did not show any significant relationship between these variables.

Gribbins, et al. [12] studied the acceptance of wireless technologies by users. The model used in this study predicted relationships between perceived ease of use and attitude toward using, perceived usefulness and attitude towards using, and behavioral intention and attitude towards using. Research showed support for the relationships between the following variables: perceived usefulness and attitude towards using, and attitude towards using and behavioral intention. Unfortunately, no support was found to verify the relationship between perceived ease of use and attitude toward using wireless technologies.

Mao [20] investigated information technology usage over time. The author predicted that perceived usefulness is related to attitude towards using; this hypothesis was supported. It was also predicted that ease of use is related directly to attitude towards using, but this hypothesis was not supported in research findings (Figure 5).

According to the model proposed by Venkatesh, et al. [28], in order to study the acceptance of personal computers, attitude toward using personal computers will not have a significant influence on behavioral intention (Figure 10). Research showed a nonsignificant effect between these two variables.

Bhattacherjee and Premkumar [2] studied the acceptance of software (Figure 11). Usefulness was predicted to have an effect on attitude toward using, attitude was predicted to have an effect on behavioral intention, and satisfaction was predicted to have an effect on attitude toward using. Strong support was found for each of these hypotheses. In another study about the acceptance of wireless technology, specifically wireless finance, the relationships between attitude toward using and each of the following were examined: perceived usefulness, perceived ease of use, and behavioral intention (Figure 12). Each of these relationships was supported [16].

In a study concerning wireless Internet, Yu, et al. [30] studied the effects of the adoption of this technology. Near-term usefulness as well as long-term usefulness were each studied in this model, along with perceived ease of use, and behavioral intention (Figure 9). Both perceived near-term usefulness and perceived long-term usefulness were predicted to have a significant positive effect on attitude towards using wireless Internet. Perceived ease of use was predicted to have a positive effect on attitude towards using wireless Internet, and attitude towards using wireless Internet was predicted to have a positive effect on a user's behavioral intentions for using wireless Internet. No results were provided for this study, however.

Martins and Kellermanns [21] used a web-based information system as their point of study for the proposed model of acceptance. As with other models, perceived usefulness and perceived ease of use were found to predict attitude towards the system. Again, these hypotheses were strongly supported. Attitude towards using the web-based system was also predicted to affect behavioral intention; as with other models, this hypothesis was also strongly supported.

H1a: A positive Attitude towards Using creates a higher Behavioral Intention to use the Internet.
H1b: A more positive Attitude towards Using the Internet produces higher levels of actual usage of the Internet.

Perceived Behavioral Control

Shim, et al. [23] studied the Internet usage intentions of users. The authors predicted perceived behavioral control would positively impact behavioral intention of users to use the system. Research findings showed strong support for this hypothesis. Venkatesh [27] studied the adoption of an Information System, using a model based on the original Technology Acceptance Model (Figure 1). He predicted that a user's perceptions of external control of the system would affect perceived ease of use of the system; this was strongly supported. Chau and Hu [3] used a business application to study the acceptance of an IT, specifically by business professionals (Figure 2). The authors predicted perceived behavioral control would affect behavioral intention to use the business application. The relationship between these variables was supported.

H2a: The greater the Perceived Behavioral Control, the higher the Behavioral Intention to use the Internet.
H2b: The greater the Perceived Behavioral Control, the greater the actual usage of the Internet.

Social Influence

Venkatesh, et al. [28] studied the adoption of personal computers using a revised version of the Technology Acceptance Model (Figure 10). The authors predicted that social factors had an effect on behavioral intention, when usage is mandatory; significant effects were found. Singletary et al. [24] studied software use by students who were forced to use the software for school. The authors believe that social norms affect image, and that social norms affect perceived usefulness of the software outside of the mandatory uses; no results were provided, however. Kleijnen, et al. [16] studied consumer acceptance of wireless finance, and believed that social influence had a direct and positive effect on the user's behav-

ioral intention to use the system. This hypothesis was supported.

Yu, et al. [30] studied wireless Internet, and predicted social influences will have a significant effect on perceived usefulness (both long-term and near term). Several articles [3, 15, 19, 23] predicted social influence would have a direct effect on behavioral intention to adopt and use the system. These articles found strong support for the effect of social influence on behavioral intention, except for the article written by Chau, et al. [3].

H3: The greater the Social Influence, the greater the Behavioral Intention to use the Internet.

Experience Using the Internet

George [11] hypothesized that the more experienced an individual is with the Internet, the more positive the individual's beliefs about the trustworthiness of the Internet. Hackbarth et al. [13] suggested that experience has a significant (positive) effect on perceived ease of use.

H4a: The more experience a user has using the Internet, the greater the behavioral intention to use the Internet.
H4b: The more experience a user has using the Internet, the more positive his/her Attitude towards Using Internet.
H4c: The more experience a user has using the Internet, the more positive his/her perceived ease of use of the Internet

Behavioral Intention

Behavioral intention refers to the user's intended behavior for accepting and using the technology. Several articles examine the relationship between experience using the Internet and the user's behavioral intention to use the Internet [1, 11, 23] each found strong support for the direct correlation of these two variables. Several other studies [8, 15, 29] examined the effect of perceived ease of use on behavioral intention. Elagarah's study [8] had no results. There were mixed findings in the other studies, as Venkatesh [27] found support for this hypothesis and Hu [15] found no support for this hypothesis.

Nine articles we reviewed predicted that the variable perceived usefulness has a direct effect on behavioral intention. Of the nine, seven articles found significant support for this hypothesis. Elgarah and Falaleeva [8] used a newly revised model to better explain the adoption of biometric technology. The authors predict that concern for information privacy will have no effect on behavioral intention when the system use is mandatory, but that concern for information privacy will have a negative effect on

behavioral intention to use the biometric technology when the system use is voluntary. The authors hypothesized that voluntariness would moderate the effect of concern for information privacy on intentions to use. Since the research study was not distributed, no results are given for these hypotheses. Venkatesh, et al. [28] studied user acceptance of personal computers (Figure 10). They correctly predicted that computer anxiety would not have a significant effect on behavioral intention, and that computer self-efficacy would also not have a significant effect on behavioral intention.

H5: A greater level of Behavioral Intention results in higher Actual Usage of the Internet.

Facilitating Conditions

Yu et al. [30] hypothesized that facilitating conditions have a significant effect on perceived usefulness (both near-term and long-term), as well as on perceived ease of use, concerning the adoption of wireless Internet.

Venkatesh, et al. [28] studied the effect of facilitating conditions on behavioral intention to use the technology (in this case – personal computers), and it was shown that facilitating conditions have a non-significant effect on behavioral intention.

H6: The greater the Facilitating Conditions the greater the Behavioral Intention to use the Internet.

Voluntariness

Amoroso and Hunsinger [1] studied the acceptance of the Internet for E-commerce purposes, using a model based on the original Technology Acceptance Model (Figure 14). The authors predicted voluntariness of using the Internet is related directly to the user's behavioral intention to use the Internet. However, no significant relationship was found between these two variables.

H7: The greater the appearance of Voluntariness in using the Internet, the greater the Behavioral Intention to use the Internet.

Perceived Ease of Use

Van der Heijden, et al. [26] hypothesized that perceived ease of use directly affects a consumer's attitude towards online purchasing. Chen, et al. [4] suggested that a consumer's perceived ease of use of a virtual store positively affects his or her attitude toward using it.

H8: A more positive Perceived Ease of Use leads to a more positive Attitude towards Using the Internet.

Perceived Usefulness

Van der Heijden et al. [26] also studied the effects of perceived usefulness compared to a consumer's attitude. They hypothesized that perceived usefulness directly affects a consumer's attitude towards online purchasing. Chen, et al. [4] hypothesized that a consumer's perceived ease of use of a virtual store positively affects his or her attitude towards using the virtual store. They found that higher perceived usefulness does not lead to higher consumer behavioral intent, however, even though other previous studies provided different findings.

H9a: The higher the Perceived Usefulness, the more positive the Attitude towards Using the Internet.
H9b The higher the Perceived Usefulness, the greater the Behavioral Intention to use the Internet.

Trust

Chiravuri and Nazareth [6] hypothesized that trust positively influences a person's intention to use or purchase. Chen et al. [5] hypothesized that a consumer's perceived trust in a virtual store positively affects his or her attitude toward using the e-store. Other research has also suggested a link between trust, behavioral intention, and attitude toward purchasing.

Risk and Privacy

Miyazaki and Fernandez [22] explored risk perceptions among consumers of varying levels of Internet experience and how those perceptions relate to online shopping activity. They also hypothesized that internet experience is negatively related to the existence of concerns regarding the privacy and security of online purchases. Miyazaki and Fernandez also predicted that the perceived risk of conducting online purchases is negatively related to the rate of purchasing products online.

E-Loyalty

Holland and Baker [14] explored the development of an e-business marketing model that capitalizes on customer participation and the likelihood of brand loyalty, following such efforts. They hypothesized that creating brand site loyalty leads to predictive behavioral and attitudinal outcomes from customers, such as repeat visits to, patronage of the site, and a more favorable view of the website.

Perceived Value

Kim and Xu [17] suggested that customer price sensitivity is lower when non-price attributes are of greater importance. Particularly, the trustworthiness of the Internet vendor has been noted as an important non-price attribute amid the uncertainty and risks of internet shopping. Kim and Xu hypothesized that perceived value is positively related to purchase intention for potential and repeat customers.

H10a: Positive perceptions towards external variables lead to a more positive Attitude towards Using the Internet.
H10b: Positive perceptions towards external variables create a higher Behavioral Intention to use the Internet. .

Actual Usage

Actual usage refers to the amount of time a user spends using the technology. Amoroso and Hunsinger (2006) studied how actual usage is affected by: perceived usefulness, behavioral intention, gender, and perceived complexity of the technology. According to their model, perceived usefulness of the Internet and behavior towards using the Internet are positively correlated with actual usage of the Internet. The results of the study showed strong correlation for each hypothesis. Perceived complexity of using the Internet was predicted to be correlated to actual usage of the Internet; this hypothesis was also found to have strong support [1].

The UTAUT model shows that behavioral intention towards personal computers will have a significant positive influence on actual usage of personal computers. This hypothesis was supported, and a direct effect was found between behavioral intention and actual usage [28].

Mao studied information technology usage and adoption. Mao's suggested research model predicts that both perceived usefulness and attitude are related to actual usage. Research findings show support for each of these hypotheses [20].

Dasgupta et al. [7] used the original TAM and extended it to better fit the acceptance of E-Collaboration technology. This extended Technology Acceptance Model predicts that perceived ease of use has a significant effect on actual system usage. It also predicts that perceived usefulness has a significant effect on actual system usage. Both of these hypotheses were strongly supported. They also predicted that actual usage of the system has a positive effect on individual performance, but this hypothesis was not supported.

Wilson, et al. [29] proposed a model to better fit the acceptance of IT usage when actual usage is not constant (Figure 13). The authors predicted that sporadic usage of a system will reduce continuing use of a system, regardless of behavioral intention to use the system. This hypothesis was strongly supported in their research.

Research Model

Therefore, based upon the literature review and hypotheses, the research model shown in Figure 15 evolved. We will use it to study the acceptance of online purchasing by consumers.

MEASUREMENT MODEL

Measurement Scales

We measured the various constructs to examine their impact on the use of Internet technologies to purchase products. We used previous TAM-related research to derive the constructs for our study. Most of our survey used a five-point Likert scale ranging from strongly agree to strongly disagree.

Survey Instrument

We developed our survey based upon previous survey questions in earlier studies. Our survey consisted of thirteen sections to measure the constructs in our model and to capture demographic data. We administered the survey online through an online tool, Survey Monkey.

Sample

Over 1,850 undergraduate students in the United States and Australia completed the online survey. The majority of students were eighteen to twenty-year old business majors taking thirteen to fifteen hours of classes. This sample is appropriate for our study since these students are representative of the desired population who purchase goods online.
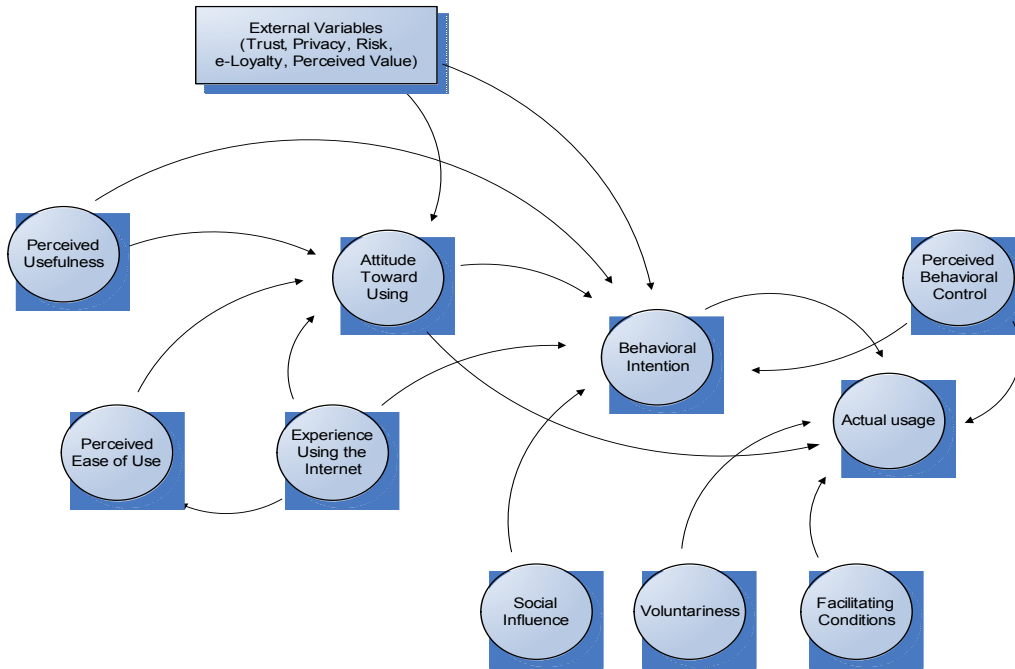
Figure 15

Reliability

By examining the Cronbach Alpha reliability coefficients shown in Table 1, we found strong support for construct reliability. Strong support for construct validity was found by examining the factor analysis data. All measurement scales showed relatively high Cronbach Al-

pha coefficients at $\alpha > 0.70$, except for affect towards use and compatibility. Compatibility is only slightly below the lower bounds for the study, at $\alpha = .645$. The Cronbach Alpha coefficient for the affect towards use construct may be the result of too few questions, or a question not being scaled properly (if the measurement scale was reversed for the specific question) at $\alpha = .313$.

Table 1: Reliability Analysis

Construct	Sub-Construct	# of Items	Cronbach Alpha Value
Attitude Towards Using	Attitude Towards Online Purchasing	4	0.883
Attitude Towards Using	Intrinsic Motivation	4	0.834
Attitude Towards Using	Risk Perceptions	5	0.706
Attitude Towards Using	Affect Toward Use	3	0.313
Attitude Towards Using	Anxiety	4	0.85
Attitude Towards Using	Worry	7	0.914
Social Influence		7	0.914
Social Influence	Compatibility	4	0.645
Perceived Behavioral Control		4	0.894
Facilitating Conditions		3	0.896
Behavioral Intention	Behavioral Intent to Use	5	0.837
Behavioral Intention	Online Purchasing	5	0.858
Actual Usage	Usage Time	3	0.897
Voluntariness		3	0.827

Validity

We used factor analysis to assess construct validity. Principal component analysis was conducted with a eight-factor solution, with eigenvalues greater than 1.0, explaining 67.9% of the variance in the data set. The results are shown in Table 2.

Table 2: Validity Analysis

Component	Total	% of Variance	Cumulative %
1	6.574	16.033	16.033
2	5.545	13.525	29.558
3	3.805	9.28	38.839
4	3.452	8.419	47.258
5	2.504	6.106	53.364
6	2.38	5.806	59.17
7	1.933	4.716	63.886
8	1.646	4.013	67.899

After examining the factor loadings that did not load strongly on any factor, that loaded on a factor other than the one intended, or that loaded relatively equally across multiple factors, an analysis of the loadings was conducted. As shown in Table 3 on the following page, all of the items from the attitude towards online purchasing construct loaded cleanly on a factor with all loadings >=.673. Intrinsic Motivation items all loaded >=.636. Items in the Social Influence construct loaded >=.566. Perceived Behavioral Control had strong loadings on a factor, with all loadings at or above .691.

ANALYSIS

Descriptive Statistics

Table 4 shows the descriptive statistics for the constructs and for the individual questionnaire items, respectively. An overview look at the means of the constructs shows high agreement with the items within the Perceived Behavioral Control construct (mean=4.10). Positive responses were also more likely within the Behavioral Intention construct (mean=4.191) and the Actual Usage construct (mean=4.083). Respondents largely show more disagreement with the items within the Voluntariness construct (mean=2.668).

Table 3: Factor Analysis

	1	2	3	4	5	6	7	8
The idea of using Web sites to buy a product or service is appealing	0.791							
I like the idea of buying a product or service via online Web sites	0.799							
Using Web sites to buy a product or service rather than from a physical store is a good idea	0.722							
I have fun shopping online	0.673							
I have fun interacting with the Internet		0.787						
Using the Web provides me with a lot of enjoyment		0.765						
I enjoy using the Web		0.719						
The Internet makes work more interesting		0.636						
Working with the Internet is fun		0.762						
People who influence my behavior think that I should use the Internet for work/school tasks			0.792					
People who are important to me think I should use the Internet for work/school tasks			0.782					
I use the Internet because of the proportion of co-workers and friends who also use the Internet to accomplish tasks			0.630					
My managers at work or teachers at school have been helpful in the use of the Internet			0.678					
My managers at work or teachers at school are very supportive of the use of the Internet for my job or school assignments			0.623					
In general, my organization where I work or my university has supported the use of the Internet to accomplish tasks			0.566					
I have control over how I use the Internet				0.691				
I have the resources needed to use the Internet effectively				0.741				
I have the knowledge necessary to use the Internet				0.748				
Given the resources, opportunities, and knowledge it takes to use the Internet, it would be easy for me to use the Internet to accomplish tasks				0.751				
Guidance is available to me in the use of the Internet					0.805			
Specialized instruction concerning the Internet is available to me					0.856			
A specific person or group is available for assistance when I have difficulties using the Internet					0.822			
I always try to use the Internet to do a task whenever it has features to help me perform it						0.492		
I always try to use the Internet in as many cases/occasions as possible						0.408		
I plan to use the Internet in the future						0.775		
I intend to continue using the Web in the future to accomplish my tasks						0.770		
I expect my use of the Web for online shopping to continue in the future							0.757	
I would consider purchasing online in the short term							0.724	
I would consider purchasing online in the long term							0.758	
I would return to Websites that I have purchased from							0.664	
I plan to purchase from new Web sites for products or services							0.724	
In general, I would buy online rather than going to a physical store							0.596	
Using the Internet is voluntary as far as work/school is concerned								0.807
I am not required to use the Internet for work/school								0.843
While the Internet enhances effectiveness in completing tasks it is not required that I use it								0.881

Table 4: Descriptive Statistics

	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic
Attitude Towards Purchasing	1.00	5.00	3.585	0.787
Intrinsic Motivation	1.00	5.00	3.546	0.499
Affect Towards Use	1.00	5.00	3.510	0.561
Worry	1.00	5.00	3.094	0.914
Social Influence	1.00	5.00	3.549	0.621
Perceived Behavioral Control	1.00	5.00	4.100	0.652
Compatibility	1.00	5.00	3.391	0.617
Facilitating Conditions	1.00	5.00	3.541	0.815
Behavioral Intention	1.00	5.00	4.191	0.633
Behavioral Intent to Purchase	1.00	5.00	3.570	0.750
Actual Usage	1.00	5.00	4.083	0.937
AU4	1.00	5.00	2.987	0.651
Voluntariness	1.00	5.00	2.668	0.997

It appears that most of the respondents in this study find the idea of shopping online appealing (mean=3.75). An examination of the Intrinsic Motivation construct shows the majority of respondents enjoy using the Web (mean=4.07), have fun interacting with the Internet (mean=4.01), and feel working with the Internet is fun (mean =3.91). The Social Influence section shows that overall, respondents feel that their workplace or university has supported the use of the Internet to accomplish tasks (mean=4.02). Likewise, respondents feel their managers at work or teachers at school also support the use of Internet to accomplish tasks (mean=3.86).

Respondents feel they have control over how they use the Internet (mean=4.07). They also feel they have the resources need to use the Internet (mean=4.08), as well as the knowledge necessary to use the Internet (mean=4.11). Given the above factors, respondents feel it is easy for them to use the Internet to accomplish tasks (mean=4.14). Concerning Facilitating Conditions, respondents agree that guidance in using the Internet is available to them (mean=3.58) as well as specialized instruction (mean=3.52).

Overall, respondents show high responses on the Behavioral Intent to Use construct. Respondents use the Internet when possible (mean=3.77), and always try to use the Internet to accomplish a task when it has features that aid in completing the task (mean=3.97). Respondents plan to use the Internet in the future (mean=4.50), and intend to continue using it as an aid to accomplishing tasks (mean=4.46).

Surprisingly, respondents did not feel that using the Internet for work or school was voluntary (mean=3.00). Though understanding the Internet enhances overall effectiveness in completing tasks, respondents felt use of the Internet was required (mean=2.63).

The Actual Usage construct focuses on online purchasing instead of overall usage. Respondents feel that they will continue purchasing online in the future (mean=4.24), and would return to websites they have previously purchased from (mean=3.98). Most would consider purchasing online in the short term (mean=3.75), and the long term (mean=3.77). Largely, respondents feel positively about buying online when compared to shopping in a physical store (mean=3.37). These statistics are shown in Table 5.

Table 5: Detailed Descriptive Statistics for Constructs

	Minimum Statistic	Maximum Statistic	Mean	Std. Error	Std. Statistic	Variance Statistic	Skewness	Std. Error
Attitude Towards Online Purchasing								
The idea of using Web sites to buy a product or service is appealing	0.00	5.00	3.75	0.028	0.870	0.756	-0.863	0.078
I like the idea of buying a product or service via online Web sites	0.00	5.00	3.66	0.029	0.912	0.831	-0.797	0.078
Using Web sites to buy a product or service rather than from a physical store is a good idea	0.00	5.00	3.31	0.030	0.955	0.912	-0.318	0.078
I have fun shopping online	0.00	5.00	3.63	0.029	0.922	0.850	-0.537	0.078
Intrinsic Motivation								
I have fun interacting with the Internet	0.00	5.00	4.01	0.019	0.818	0.669	-0.903	0.057
Using the Web provides me with a lot of enjoyment	0.00	5.00	3.87	0.021	0.887	0.787	-0.640	0.057
I enjoy using the Web	0.00	5.00	4.07	0.018	0.784	0.615	-0.942	0.057
The Internet makes work more interesting	0.00	5.00	3.78	0.025	0.785	0.616	-0.797	0.078
Working with the Internet is fun	0.00	5.00	3.91	0.024	0.761	0.597	-0.835	0.078
Social Influence								
People who influence my behavior think that I should use the Internet for work/school tasks	0.00	5.00	3.56	0.027	0.852	0.726	-0.714	0.078
People who are important to me think I should use the Internet for work/school tasks	0.00	5.00	3.59	0.026	0.831	0.690	-0.765	0.078
I use the Internet because of the proportion of co-workers and friends who also use the Internet to accomplish tasks	0.00	5.00	3.27	0.031	0.968	0.936	-0.393	0.078
My managers at work or teachers at school have been helpful in the use of the Internet	0.00	5.00	3.67	0.027	0.851	0.724	-0.859	0.078
My managers at work or teachers at school are very supportive of the use of the Internet for my job or school assignments	0.00	5.00	3.86	0.026	0.825	0.681	-0.935	0.078
In general, my organization where I work or my university has supported the use of the Internet to accomplish tasks	0.00	5.00	4.02	0.025	0.796	0.634	-1.021	0.078
Perceived Behavioral Control								
I have control over how I use the Internet	0.00	5.00	4.07	0.024	0.763	0.582	-1.375	0.078
I have the resources needed to use the Internet effectively	0.00	5.00	4.08	0.024	0.744	0.554	-1.386	0.078
I have the knowledge necessary to use the Internet	0.00	5.00	4.11	0.024	0.747	0.557	-1.435	0.078
Given the resources, opportunities, and knowledge it takes to use the Internet, it would be easy for me to use the Internet to accomplish tasks	0.00	5.00	4.14	0.024	0.741	0.550	-1.430	0.078

	Minimum Statistic	Maximum Statistic	Mean	Std. Error	Std. Statistic	Variance Statistic	Skewness	Std. Error
Facilitating Conditions								
Guidance is available to me in the use of the Internet	0.00	5.00	3.58	0.027	0.856	0.733	-0.878	0.078
Specialized instruction concerning the Internet is available to me	0.00	5.00	3.52	0.028	0.886	0.789	-0.798	0.078
A specific person or group is available for assistance when I have difficulties using the Internet	0.00	5.00	3.52	0.030	0.942	0.888	-0.701	0.078
Behavioral Intent to Use								
I always try to use the Internet to do a task whenever it has features to help me perform it	0.00	5.00	3.97	0.020	0.845	0.715	-0.946	0.057
I always try to use the Internet in as many cases/occasions as possible	0.00	5.00	3.77	0.021	0.917	0.842	-0.656	0.057
I plan to use the Internet in the future	0.00	5.00	4.50	0.016	0.695	0.483	-1.902	0.057
I intend to continue using the Web in the future to accomplish my tasks	0.00	5.00	4.46	0.016	0.703	0.494	-1.736	0.057
Actual Usage								
I expect my use of the Web for online shopping to continue in the future	0.00	5.00	4.24	0.020	0.882	0.778	-1.389	0.057
I would consider purchasing online in the short term	0.00	5.00	3.75	0.029	0.913	0.834	-1.001	0.078
I would consider purchasing online in the long term	0.00	5.00	3.77	0.029	0.922	0.849	-0.925	0.078
I would return to Websites that I have purchased from	0.00	5.00	3.98	0.027	0.839	0.704	-1.266	0.078
I plan to purchase from new Web sites for products or services	0.00	5.00	3.64	0.029	0.897	0.805	-0.727	0.078
In general, I would buy online rather than going to a physical store	0.00	5.00	3.37	0.029	1.232	1.518	-0.255	0.057
Voluntariness								
Using the Internet is voluntary as far as work/school is concerned	0.00	5.00	3.00	0.028	1.189	1.413	-0.093	0.057
I am not required to use the Internet for work/school	0.00	5.00	2.38	0.027	1.153	1.329	0.586	0.057
While the Internet enhances effectiveness in completing tasks it is not required that I use it	0.00	5.00	2.63	0.026	1.127	1.270	0.291	0.057

Correlations

Next, the correlation matrix (shown in Table 6) was examined, investigating only correlations with a significance > .450 since our sample size was quite large (n = 1,868). Correlations were used to examine the relationships between the constructs. This provides an initial test for how well the hypotheses were supported. We found strong support for the hypothesized correlation between Attitude toward Using and Behavioral Intention (r=.461), validating H1a. The relationship between Perceived Behavioral Control and Behavioral Intention was strongly correlated (r=.698), showing initial support for H2a. H2b was also supported with a strong correlation between Perceived Behavioral Control and Actual Usage (r=.479). A significant correlation exists between Social Influence and

Behavioral Intention (r=.526) supporting H3. The relationships hypothesized in H9a and H9b between Perceived Usefulness and Attitude toward Using (r=.448), and Perceived Usefulness and Behavioral Intention (r=.563) were found to be statistically significant, supporting H9a and H9b. A relationship between the external variable trust and Behavioral Intention was also found to be significant (r=.478), showing initial support for H10b. However, in the correlation matrix, there are three separate constructs for trust (TR1, TR2, TR3). TR1 measures a person's disposition to trust in general. TR2 looks at a person's trust in a vendor or institution. TR3 measures whether a person feels safe due to structural assurances such as protection by PayPal, a 1-800 number for customer issues, or protection by organizations such as the Better Business Bureau.

Only one of the three trust measures showed a statistically significant relationship with Behavioral Intention. Because of this, the relationship between Trust and Behavioral Intention is most likely not significant. No significant correlations (where r >.450) were found for H1b, H5, H6, H7, H8, or H10a.

Table 6: Correlation Matrix

	ATP	IM	ATU	PEOS	SI	PBC	PU	FC	BI	BIP	AU	EL	VOL	TR1	TR2	TR3	RP
ATP																	
IM	0.605																
ATU		0.643															
PEOS	0.592	0.497															
SI																	
PBC		0.509		0.471													
PU		0.456	0.448														
FC					0.459												
BI	0.514	0.591	0.461	0.490	0.526	0.698	0.563										
BIP	0.728	0.515		0.537		0.476			0.627								
AU		0.491			0.479												
EL										0.462							
VOL																	
TR1																	
TR2	0.506								0.478	0.578		0.535		0.695			
TR3	0.445									0.483		0.466		0.586	0.787		
RP																	

Regression Analysis

We also used regression analysis to test the hypotheses and allow further validation of the instrument. Table 7 shows the linear regression model for Behavioral Intention. The variance explained was very strong (R^2=.627) with all the following coefficients found to be significant at p = .000: Attitude toward Purchasing, Social Influence, Perceived Behavioral Control, E-Loyalty, and Perceived Usefulness. This provides strong statistical support for H1a, H3, H2a, H10b, and H9b, respectively. Experience Using the Internet was not found to be statistically significant, giving no statistical support for H4a.

Table 7: Regression Analysis for Behavioral Intention

Dependent Variable	R Square	F-value (sig)	Independent Variables	B	Std. Error	Std. Beta	t	Sig.
Behavioral Intention	62.7%	259.179	Attitude Toward Purchasing	0.153	0.019	0.190	7.995	0.000
		0.000	Social Influence	0.191	0.024	0.190	8.094	0.000
			Experience Using Internet	-0.001	0.022	-0.001	-0.039	0.969
			Perceived Behavioral Control	0.454	0.024	0.468	19.090	0.000
			E-Loyalty	0.096	0.025	0.086	3.813	0.000
			Perceived Usefulness	0.136	0.024	0.132	5.729	0.000

The analysis for Behavioral Intention to Purchase online is shown in Table 8. The linear regression model shows a very strong amount of variance explained (R^2=.598). The coefficients for Experience Using Internet (p=.008), Perceived Behavioral Control (p=.000), and E-Loyalty (p=.000) were all statistically significant, showing strong support for hypotheses H4a, H2a, and H10b, in that order. However, for the External Variables construct, E-Loyalty was the only variable to be tested in correlation with the Behavioral Intention to Purchase construct. The constructs Attitude toward Purchasing and Behavioral Intention to Purchase are sub-constructs of Attitude toward Using and Behavioral Intention, respectively. The significant relationship between these two constructs (p=.000) gives support to hypothesis H1a. However, the relationships between Behavioral Intention to Purchase and Social Influence (p=.062), and Perceived Usefulness (p=.530) were not found to be statistically significant. Therefore, hypotheses H3 and H9b were not supported.

Table 8: Regression Analysis for Behavioral Intention to Purchase

Dependent Variable	R Square	F-value (sig)	Independent Variables	B	Std. Error	Std. Beta	t	Sig.
Behavioral Intention to Purchase	59.8%	228.637	Attitude Toward Purchasing	0.540	0.024	0.565	22.836	0.000
		0.000	Social Influence	0.054	0.029	0.046	1.871	0.062
			Experience Using Internet	0.071	0.027	0.059	2.669	0.008
			Perceived Behavioral Control	0.209	0.029	0.182	7.135	0.000
			E-Loyalty	0.215	0.031	0.163	6.938	0.000
			Perceived Usefulness	-0.018	0.029	-0.015	-0.629	0.530

Table 9 illustrates the regression analysis for Attitude toward Purchasing. The amount of variance explained by this model is fairly high (R^2=.446). Hypotheses H8 and H9a were strongly supported where p=.000 for both Perceived Ease of Use and Perceived Usefulness. The external variables tested in relation to Attitude toward Purchasing were Privacy, Trust, and Risk Perceptions.

As discussed earlier, the Trust construct was tested in three parts (TR1 – Disposition to Trust, TR2 – Institution-based Trust, and TR3, Structural Assurances). Trust was found to be significant as TR2 (p=.000) and TR3 (p=.013) were found to be significant, despite that TR1 was not found to be significant (p=.055), showing some support for hypothesis H10a. The Privacy (p=.252) and Risk Perceptions (p=.398) constructs were not found to be significant. Surprisingly, support was not found for H4b as the Experience Using the Internet was not found to be significant (p=.074).

Table 9: Regression Analysis for Attitude Toward Purchasing

Dependent Variable	R Square	F-value (sig)	Independent Variables	B	Std. Error	Std. Beta	t	Sig.
Attitude Toward Purchasing	44.6%	95.353	Experience Using Internet	0.058	0.032	0.045	1.787	0.074
		0.000	Perceived Ease of Use	0.488	0.035	0.41	14.063	0.000
			Perceived Usefulness	0.140	0.035	0.109	4.004	0.000
			Privacy	0.042	0.037	0.035	1.145	0.252
			Disposition to Trust	-0.075	0.039	-0.067	-1.919	0.055
			Institution-Based Trust	0.269	0.052	0.238	5.132	0.000
			Structural Assurances	0.106	0.042	0.101	2.500	0.013
			Risk Perceptions	-0.027	0.032	-0.021	-0.846	0.398

Table 10 illustrates the regression analysis for Affect toward Use. The amount of variance explained by this model is not very high (R^2=.254), leaving in question the reliability of this regression analysis. Affect toward Use (like Behavioral Intention to Purchase) is a sub-construct of Attitude toward Purchasing (or Using). The

same constructs that were tested as independent variables affecting Attitude toward Purchasing were tested against Affect toward Use. Perceived Ease of Use and Perceived Usefulness were again found to have a strong relationship with the dependent variable where p=.000. In this regression analysis, however, the construct Experience using Internet was found to be significant (p=.000), showing

support for H4b. Again, Privacy (p=.119) and Risk Perceptions (p=.433) were not found to have a significant relationship with Affect toward Use as a dependent variable. However, all three Trust constructs were tested, but two of the three were not found to be significant. Only TR2 was significant (p=.024).

Table 10: Regression Analysis for Affect Toward Use

Dependent Variable	R Square	F-value (sig)	Independent Variables	B	Std. Error	Std. Beta	t	Sig.
Affect Toward Use	25.4%	40.238	Experience Using Internet	0.111	0.029	0.111	3.803	0.000
		0.000	Perceived Ease of Use	0.135	0.031	0.146	4.318	0.000
			Perceived Usefulness	0.333	0.032	0.333	10.551	0.000
			Privacy	-0.052	0.033	-0.055	-1.561	0.119
			Trust 1	0.052	0.035	0.06	1.472	0.141
			Trust 2	0.107	0.047	0.122	2.265	0.024
			Trust 3	-0.045	0.038	-0.056	-1.183	0.237
			Risk Perceptions	-0.022	0.029	-0.022	-0.784	0.433

Lastly, Table 11 shows the regression analysis for the Actual Usage construct. A fairly significant amount of variance is explained in this model (R^2=.365). The relationship between Behavioral Intention and Actual Usage is significant (p=.000), sustaining Hypothesis H5. The relationships between Actual Usage and Voluntariness and Perceived Behavioral Control are also key at the p=.000 level of significance. This confirms hypotheses H7 and H2a, respectively. The construct Attitude toward

.

Purchasing (p=.024) as well as its sub-construct Affect toward Use (p=.003) have significant relationships with Actual Usage as the dependent variable. Intrinsic Motivation is also a sub-construct of Attitude toward Using, and has a very significant relationship with Actual Usage (p=.000). These three constructs show a great deal of support for hypothesis H1b. Surprisingly, Voluntariness does not prove to have a significant relationship with Actual Usage (p=.216), giving no support for hypothesis H7

Table 11: Regression Analysis for Actual Usage

Dependent Variable	R Square	F-value (sig)	Independent Variables	B	Std. Error	Std. Beta	t	Sig.
Actual Usage	36.5%	79.701	Behavioral Intention	0.359	0.060	0.241	5.966	0.000
		0.000	Facilitating Conditions	-0.042	0.034	-0.036	-1.237	0.216
			Voluntariness	0.106	0.025	0.109	4.196	0.000
			Perceived Behavioral Control	0.235	0.053	0.164	4.452	0.000
			Affect Toward Use	0.157	0.052	0.103	3.030	0.003
			Attitude Toward Purchasing	0.091	0.040	0.076	2.268	0.024
			Intrinsic Motivation	0.250	0.064	0.161	3.877	0.000

DISCUSSION AND CONCLUSIONS

This study's purpose was to create a new model to study Acceptance of Online Purchasing by consumers

based on the original Technology Acceptance Model (TAM) and previous related studies. The relationships between variables found in our proposed model of hypotheses and the resulting model have minimal differences. The final model is one that may be used to predict

the acceptance of online purchasing by consumers. We feel it may be useful for a variety of stakeholders, not only researchers, but also companies with E-business offerings to examine the research done in this study, in hopes of getting the greatest benefit out of their websites.

Support for Hypotheses

Table 12 breaks down each of the hypotheses and the results of each based on the Correlation analysis and the Regression Analysis.

Table 12: Summary of Hypotheses and Findings

Hypothesis	Variable 1 (Independent)	Variable 2 (Dependent)	Correlation Analysis	Sig	Support (sig <=0.01)	Regression Analysis	Sig	Support (sig <=0.01)
1a	Attitude Towards Using	Behavioral Intention	r = .461	0.000	yes	β = .190	0.000	yes
1b	Attitude Towards Using	Actual Usage	r = .402	0.000	yes	β = .103	0.003	yes
2a	Perceived Behavioral Control	Behavioral Intention	r = .698	0.000	yes	β = .468	0.000	yes
2b	Perceived Behavioral Control	Actual Usage	r = .479	0.000	yes	β = .164	0.000	yes
3	Social Influence	Behavioral Intention	r = .526	0.000	yes	β = .190	0.000	yes
4a	Experience Using Internet	Behavioral Intention	r = .520	0.000	yes	β = -.001	0.969	no
4b	Experience Using Internet	Attitude Towards Using	r = .298	0.000	yes	β = .045	0.074	no
4c	Experience Using Internet	Perceived Ease of Use	r = .322	0.000	yes	N/A	N/A	N/A
5	Behavioral Intention	Actual Usage	r = .371	0.000	yes	β = .241	0.000	yes
6	Facilitating Conditions	Actual Usage	r = .259	0.000	yes	β = -.036	0.216	no
7	Voluntariness	Actual Usage	r = .078	0.006	yes	β = .109	0.000	yes
8	Perceived Ease of Use	Attitude Towards Using	r = .345	0.000	yes	β = .410	0.000	yes
9a	Perceived Usefulness	Attitude Towards Using	r = .448	0.000	yes	β = .109	0.000	yes
9b	Perceived Usefulness	Behavioral Intention	r = .563	0.000	yes	β = .132	0.000	Yes

It can be concluded that a more positive Attitude Toward Using the Internet creates a greater Behavioral Intention to use the Internet (H1a), and increases the Actual Usage of the Internet (H1b). We found the relationship between attitude toward using and behavioral intention to be somewhat surprising. Sun (2003) found in a comparative analysis of TAM study results that the relationship between Attitude and Behavioral Intention was only statistically significant 43% of the times it had been studied. The regression analyses shown in Table 12 also support Hypotheses H1a and H1b.

The extremely strong correlation between Perceived Behavioral Control and Behavioral Intention (r = .698) supports H2a; the greater the Perceived Behavioral Control, the higher the Behavioral Intention to use the Internet. Hypothesis H2b was also supported, which stated that the greater the level of Perceived Behavioral Control, the greater the Actual Usage of the Internet (r=.479). These

findings were consistent with our expectations based upon previous TAM-related research, and the regression analyses also supported the correlations.

We can conclude that greater Social Influence positively affects Behavioral Intention to use the Internet, as a strong correlation was reported (r=.526) and the beta weight from the regression analysis (.190) was significant at the p <.001 level.

We discovered mixed findings for H4a and H4b, however. Even though the correlations between Experience Using the Internet and: H4a – Behavioral Intention (r=.520) and H4b – Attitude Towards Using (r=.298) were both significant, Experience using the Internet did not emerge as a significant predictor in the regression analyses using Behavioral Intention or Attitude Towards Using as dependent variables.

The correlation for H5 (r=.371) is moderate; support was found for this hypothesis in the Regression

Analysis: the greater the level of Behavioral In-
 We also discovered mixed findings for H6. The correla-
tion between Facilitating Conditions and Actual Usage is
significant (r=.259) but somewhat weak. Facilitating
Conditions was not significant in the regression analysis
for predicting Actual Usage. Therefore, no relationship
can be concluded about the effects of Facilitating Condi-
tions on Actual Usage.

Both analyses (correlation and regression) show
support for H7, but due to the extremely weak correlation
(r=.078), the level of Voluntariness may not increase or
decrease the amount of Actual Usage of the Internet.

Hypothesis H8 is supported by both the correla-
tion and regression analyses, implying that a greater Per-
ceived Ease of Use results in a more positive Attitude
Toward Using the Internet.

We also found support for Hypotheses 9a and 9b.
A greater level of Perceived Usefulness results in a more
positive Attitude towards Using the Internet (H9a), and
increases Behavioral Intention to Use the Internet (H9b).

Major Findings

The linear regression model shows an impressive
amount of variance explained for Behavioral Intention (R^2
= .627). Not only are the traditional TAM variables im-
portant in predicting behavioral intention, but social influ-
ence (p<.001), perceived behavioral control (p<.001), and
e-loyalty (p<.001) are all significant constructs. It seems
that the model is quite robust in predicting Behavioral
Intention.

When limiting behavioral intention to only exam-
ine a consumer's intent to purchase from an online site,
the amount of variance explained remains quite high (R^2 =
.598). Several interesting differences occur when looking
just at a person's intent to purchase online, however.
First, the traditional TAM construct Perceived Usefulness
becomes non-significant in the regression equation
(p=.530). In addition, Social Influence is not as important
(p=.062) as in the previous model looking only at Behav-
ioral Intention.

We also discovered that trust, a construct not in-
cluded in the original TAM, plays an important role in
influencing consumers' attitudes toward purchasing. In-
terestingly, a person's experience using the Internet is not
significant in predicting his or her attitude toward
purchasing (p=.074). Privacy (p=.252) and risk
perceptions (p=.398) are also less important to consumers
than we expected to find.

When we limit the scope of the research to look
only at consumers' Affect Towards Use (a subconstruct of
Attitude Toward Using), we find that Experience Using

tention, the greater the Actual Usage of the Internet.
the Internet becomes significant in predicting affect. As
expected, perceived ease of use and perceived usefulness
are significant in predicting both attitude toward purchas-
ing and affect towards use.

Value to the Practitioner

Businesses must adapt to the technological
changes in the business world. More companies are sell-
ing over the Internet than ever before. Companies must be
able to meet customers' needs, not just in physical stores,
but also through online purchasing sites. Our model and
results can help practitioners better understand how to
meet the desires of their online customers.

This study provides managers with a framework
for which areas they need to focus upon when launching
new online products, such as shaping and/or changing
their consumers' attitude toward using the Internet, mak-
ing their Website easier to use, and enhancing the per-
ceived usefulness of the technologies that allow consum-
ers to access their products online. The model we pre-
sented in this paper also serves as an important first step
toward subsequent predictive modeling with critical mar-
keting variables.

Limitations

This research investigated student consumers
whose age range was predominantly between 18 – 22
years. Our sample was limited to students working on
undergraduate degrees at universities in the United States
and Australia. To the extent that these consumers are typi-
cal of online consumers, the results will hold across more
general populations [9]. Gefen et al. [10] found that, al-
though Remus used business students as good surrogates
for managers, students were good subjects for studying
Internet-based shopping behaviors and that their status as
"student" did not impact the validity of their study.

We did not examine all of the individual and en-
vironmental factors that may influence a consumer's cog-
nitive and emotional responses to purchasing through the
Internet. For instance, we did not consider physical stim-
uli such as colors and personality traits [18].

Future Research

Future researchers may want to examine the
shopping characteristics of other age groups and/or look at
Internet purchasing in other countries. Expanding the
number of constructs measured may provide researchers
with new insight on consumers' usage of e-commerce

sites. Adding other variables could increase the predictive power of the model.

Researchers could also look at the correlation between the type of product purchased and the type of Internet technology used to purchase it. Consumers are beginning to access the Internet more through new technologies including Smartphones, the iPod Touch and iPhone, and similar devices.

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