THE EFFECTS OF TRUST AND ENJOYMENT ON INTENTION TO PLAY ONLINE GAMES

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ABSTRACT

As online games grow in importance as an electronic commerce application, researchers and practitioners increasingly believe that understanding online game player behavior is critical to the success of online game vendors. In an attempt to gain new insights into the determinants of behavioral intention to play online games, we propose a theoretical model that augments the theory of reasoned action (TRA) with two new constructs, trust and enjoyment. Within the model framework, we investigate the impact of trust and enjoyment on behavioral intention as well as on behavioral attitude. Our proposed model is tested by using questionnaire responses of 253 online game players. As hypothesized, attitude, enjoyment, and subjective norms predict intention, and enjoyment significantly affects attitude. The results also show that trust affects intention only indirectly through attitude. The paper contributes by highlighting the roles of trust and enjoyment in the online gaming context.

Keywords: enjoyment, online games, TRA, trust

1. Introduction

In the past decade, the business of online games has grown rapidly due to advances in personal computing and the remarkable penetration of the high-speed Internet. *DFC Intelligence* [2006] estimates that the total revenue of the online game industry will grow from $3.4 billion in 2005 to over $13 billion in 2011. The market research firm also estimates that the number of global online game players will increase from 124 million in 2005 to 376 million by 2009. The rapid growth of online gaming businesses calls for an investigation to discover what key factors motivate players to play games online. Little empirical study, however, has been conducted on the determinants of player behavior.

Online games are played through the Internet [Hilton 2006]. Unlike traditional PC or console games where one or two players play a game on a personal computer, online games allow many players around the world to play together on a game server via the Internet. With a monthly subscription fee of about $15, players can now play online almost all popular PC titles such as *Battlefield*, *Counter-Strike*, *World of Warcraft*, and *Call of Duty*. Meanwhile, a new breed of online game titles such as *Star Wars Galaxies*, *EverQuest*, and *Dark Age of Camelot*, known as massively multiplayer online games (MMOGs), are available through the Internet only. MMOGs allow hundreds of thousands of players to simultaneously interact in a virtual game world. Online gaming websites, such as *Yahoo! Games*, *MSN Zone*, and *Pogo*, attract tens of millions of registered players and have 150,000 to 200,000 simultaneous users at any given time [*DFC Intelligence* 2004].

Players' intention to play online games is of considerable interest because creators, sponsors, and operators of online games can benefit greatly from improved understandings of the driving factors behind players' intention. Understanding player intention is also an important first step for industry vendors in their quest to motivate players to visit online game websites more often and to develop customer loyalty. Moreover, other segments of the online entertainment industry, such as *IPTV* (Internet Protocol Television) and *Podcast,* may also benefit from improved understandings of player intention in online gaming settings.

The purpose of this study is to develop and empirically test a theoretical model of the determinants of intention to play online games. The proposed theoretical model integrates trust and enjoyment into the theory of reasoned

action (TRA). TRA suggests that behavioral intention is a function of an individual's attitude toward the behavior and the individual's subjective norms. To adapt TRA to the online gaming context, we extend it with two important constructs: trust and enjoyment. Prior research suggests that trust is the foundation of e-commerce [Fukuyama 1995; Keen 1999; Morgan & Hunt 1994; Williamson 1985], and we argue the same holds for online gaming because, like other e-commerce applications, it involves providing services to consumers via Internet. Due to the recreational nature of online gaming, one aspect is essential to study: the element of enjoyment. Previous research has found enjoyment to be a critical factor in other online activities such as e-mail use and online shopping [Eighmey & McCord 1998; Jarvenpaa & Todd 1997a]. Because online gaming is an e-commerce application with an emphasis on generating enjoyable experiences, we focus our research attention on roles of trust and enjoyment in the online gaming context.

The remainder of the paper is organized as follows. Section 2 reviews the theoretical background of TRA, trust, and enjoyment. Section 3 presents the research model and hypotheses. Section 4 provides a discussion of the research method. Section 5 follows with a discussion of the results, contributions, and key insights. Section 6 provides implications and limitations. Section 7 follows with conclusion.

2. Theoretical Background
2.1. Theory of Reasoned Action

TRA is a well-established general theory of human behavior in social psychology [Fishbein & Ajzen 1975; Ajzen & Fishbein 1980]. According to the theory, the most important predictor of an individual's behavior is his or her intention of performing the behavior, and the behavioral intention is determined by the individual's attitude toward the behavior and the individual's subjective norms.

An individual's attitude is the degree to which the individual likes or dislikes an object [Fishbein & Ajzen 1975]. When TRA is applied to human behavior research, "object" generally refers to a behavior. The theory postulates that an individual's attitude toward a behavior involves the individual's belief that a particular behavior will lead to certain outcomes and the individual's evaluation of those outcomes. If the individual believes that the outcome of the behavior will be beneficial, the individual is then more likely to perform or intend to perform the behavior [Sheppard et al. 1988].

Subjective norm is an individual's judgment about whether most people who are important to the individual will approve of a particular behavior under consideration [Franzoi 2003]. As the definition implies, when people decide whether to perform particular behaviors, they consider the normative expectations of others they view as important, such as friends, coworkers, and schoolmates.

We have chosen TRA as our theoretical foundation for two reasons. First, TRA is a well-established theory of human behavior and has been successfully applied in studying online consumer behavior [Hansen et al. 2004; Njite & Parsa 2005]. Second, we have chosen TRA over the similar technology acceptance model (TAM) because Hsu and Lu [2004] find one important TAM construct -- perceived usefulness -- does not directly affect behavioral intention, while the two TRA constructs -- attitude and subjective norms -- do. The authors provide one possible reason: when applied to studying entertainment technology such as online gaming, TAM may not be as powerful as it is in studying problem-solving technologies such as word processing systems. For those two reasons, we believe that TRA, a very general theory of human behavior [Ajzen & Fishbein 1980], is a better fit for studying player behavior in entertainment technology use.

2.2. Trust

Trust in e-commerce research has been defined as a belief that a Web vendor will perform some activities in accordance with consumers' confidence [Doney & Cannon 1997; Gefen 2002; Pavlou & Gefen 2004]. Because the online environment is impersonal, consumers often feel more uncertain about online vendors and the outcome of online transactions. Online vendors must therefore act purposefully to help consumers overcome uncertainty by building trust in vendors' websites and in the Internet as a medium for transactions [Nijite & Parsa 2005]. Researchers believe that trust is the foundation of e-commerce [Fukuyama 1995; Keen 1999; Morgan & Hunt 1994; Williamson 1985] and is the most important factor in the success of an online vendor [Kimery & McCord 2002; McKnight et al. 2002].

Unlike traditional offline trust, the objects of trust in e-commerce are the websites and the Internet as transaction media [Bart et al. 2005; McKnight et al. 1998]. Offline trust is developed based on consumers' interactions with physical stores, while online trust is generated through consumers' interactions with online vendors' websites [Jarvenpaa et al. 2000]. More specifically, factors such as consumers' perception of a site's ability to perform expected activities, the accuracy of the information provided by a site, and a site's conformance between saying and doing, would contribute to the perception of trust in that site [Bart et al. 2005; Koufaris & Hampton-Sosa 2004].

Trust is important in the online gaming context for the following reasons. First, players must provide personal information when they register. Such personal information is subject to potential abuse; for example, the data might be used for marketing solicitations or shared with third parties. Thus, players may have concerns about the misuse of their personal information. Second, some online gaming websites, including most MMOGs (e.g., *World of Warcraft* and *Star Wars Galaxies*), charge for playing, so players must provide their credit card information. Therefore, they may worry about credit card fraud. Third, online game players rely on providers to protect their virtual avatars, currency, and items (e.g., swords, cloaks, and gauntlets). These virtual assets may be as important to game users as real assets. In fact, some online game websites (e.g., Station.Sony.com) allow players to exchange virtual currency and items for real money. Thus, players may worry about whether their virtual assets are well protected. Finally, the delivery of online games is subject to uncertainty. Network congestion, server overload, or server failure can substantially impair players' gaming experiences and interests [Claypool & Claypool 2006]. Therefore, online game players may have concerns about whether websites are able to provide quality online gaming service. Such concerns and worries call for the involvement of trust in the online gaming context.

2.3.   Enjoyment

In online gaming settings, players tend to be motivated mostly by intrinsic interests [Huang & Cappel 2005; Kim et al. 2002], so this paper focuses on intrinsic motivation. According to previous research, when individuals' behaviors are prompted by intrinsic motivation such as interest and enjoyment, they are more willing to persist in such behaviors in the future [Deci & Ryan 1985; Deci et al. 1999]. As the conceptualization of intrinsic motivation, enjoyment has received considerable research attention in recent years [Li et al. 2005; Koufaris 2002; Venkatesh 2000]. Enjoyment can be defined as the degree to which performing an activity is perceived as providing pleasure and joy in its own right, aside from performance consequences [Davis et al. 1989; Venkatesh 2000].

Two main reasons surface for studying enjoyment in this research. First, the impact of enjoyment on behavioral intention has yet to be examined in the online gaming context. To our knowledge, studies in electronic commerce have so far explored the role of enjoyment in instant messaging [Li et al. 2005] and online shopping [Koufaris 2002] but not online gaming. Second, even with strong theoretical basis, previous research on the role of enjoyment in system usage has yielded mixed results. Igbaria et al. [1995] find no significant effect of enjoyment on system use behavior, whereas Jarvenpaa and Todd [1997a] do find a significant effect. In their empirical investigation of intrinsic and extrinsic motivation in Internet usage, Teo and his colleagues [1999] find that enjoyment has an effect on the frequency of usage but no significant effect on the diversity of usage, and thus they acknowledge the need for additional research to examine the role of enjoyment in behavior.

3.   Research Model and Hypotheses

Drawing upon the established TRA framework and prior empirical findings, we propose a conceptual model that combines the theoretical strength of TRA with two new constructs that capture the uniqueness of the online game environment, namely, trust and enjoyment. In our proposed model (as depicted in Figure 1), intention to play is a function of trust in online game websites, attitude toward playing online games, online gaming enjoyment, and subjective norms. In addition, attitude toward playing online games is impacted by trust in online game websites and online gaming enjoyment.

3.1.   The Impact of Trust on Intention and Attitude

Prior research in e-commerce indicates that high trust in online retailer websites results in high online purchase intention, while low trust in online retailer websites decreases consumers' willingness to purchase online [Gafen 2000, 2002; Jarvenpaa & Tractinsky 1999; McKnight & Chervany 2002; Pavlou 2003; Pavlou & Gefen 2004; Yoon 2002]. We think such relationships could carry over to online gaming for the following reasons.

First, trust has been recognized as a vital enabling factor for the consumer-merchant relationship in an online environment where there is fear, risk, and uncertainty [Gefen et al. 2003; Hoffman et al. 1999; Mayer et al. 1995]. Therefore, players' trust in online game websites can reduce their uncertainty about the new entertainment environment and make them feel comfortable interacting with the websites, and thus players are more likely to form the intention to play online games. Second, trust in an online game website leads players to believe that the website has the ability to perform expected activities such as delivering high-quality online game experiences. Therefore, players are more likely to be attracted to that trusted website. Third, players who trust an online game website will consider the site's information about online games to be believable. Hence, probability is high that they will return to the website to access that useful information or to try the online games. Finally, players who trust an online game website will perceive that the vendor is unlikely to engage in opportunistic activities such as inappropriate use of players' personal information [Gefen et al. 2003]. Consequently, users will be more positive toward playing online games. The above arguments lead to the following hypothesis:

Hypothesis 1: Trust in online game websites is positively related to intention to play online games.

Trust is also identified as an important antecedent to consumer attitude toward online purchasing [Jarvenpaa & Tractinsky 1999; McKnight & Chervany 2002; Pavlou 2002; Song & Zahedi 2002]. Njite and Parsa [2005] argue that trust as a behavioral belief should facilitate the formation of positive attitude toward a trusting behavior such as online shopping. Similarly, by reducing players' uncertainty about the new entertainment environment and increasing their comfort in interacting with online game websites, trust facilitates players to create positive attitudes toward playing online games. Conversely, lack of trust causes players to experience uncertainty and discomfort, and thus they are likely to develop negative attitudes toward playing online games.
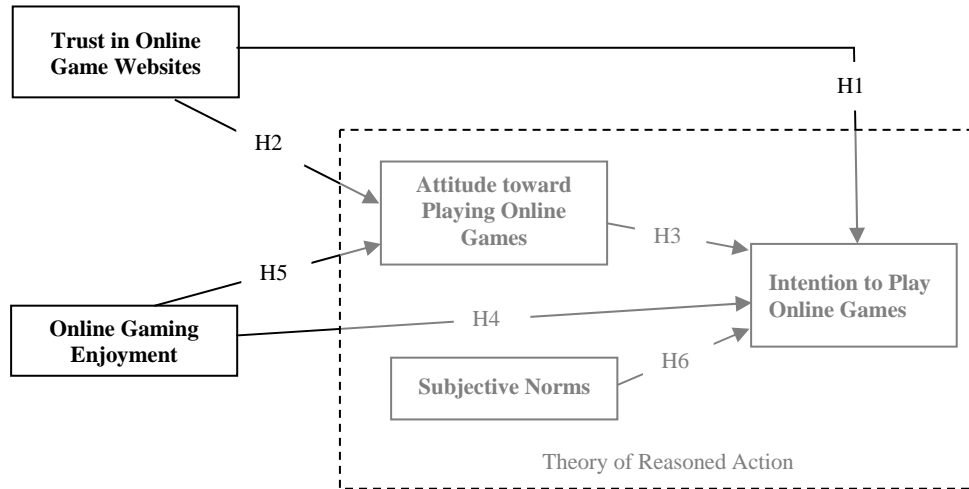

Figure 1: Research Model

The relationship between trust and attitude is also implied by Ajzen and Fishbein [1980] and by Pavlou [2002; 2003]. In a study related to TRA, Ajzen and Fishbein [1980] claim that an individual's attitude toward a behavior is determined by a set of salient beliefs the individual holds about performing the behavior. Later, in 2002 and 2003, Pavlou states that trust can be viewed as one of those salient behavioral beliefs that can directly influence consumers' attitudes toward online purchasing. Pavlou [2003] also highlights that "in general, the proposed relationship between trust and attitude is justified by placing party trust in the context of TRA as a behavioral belief." In light of this, we hypothesize that trust as a behavioral belief impacts a player's attitude toward playing online games.

Hypothesis 2: Trust in online game websites is positively related to attitude toward playing online games.

3.2.   The Impact of Attitude on Intention

The relationship between attitude and behavioral intention is at the core of the TRA [Ajzen & Fishbein 1980]. Previous research in e-commerce suggests that attitude plays a crucial role in an individual's behavioral intention [Kotler 2003; McKnight & Chervany 2001]. For example, in a study investigating factors that influence online shopping, Njite and Parsa [2005] empirically show that consumer attitude toward online shopping significantly affects purchase intention. Attitude in online gaming settings involves an overall evaluation of the outcome of playing. If a player has a positive attitude toward playing online games, the player is more likely to visit game websites and to participate. Conversely, negative attitude discourages a player from even visiting the game website, let alone playing. Therefore, we hypothesize that attitude will impact player intention to play online games.

Hypothesis 3: Attitude toward playing online games is positively related to intention to play online games.

3.3.   The Impact of Enjoyment on Intention and Attitude

Enjoyment can occur not only in the exercise of physical activities but also in the pursuit of mental activities such as playing chess [Csikszentmihalyi 1990]. Enjoyment is critical not only in offline settings [Blakney & Sekely 1994; Forman & Sriram 1991], but also in online contexts [Jarvenpaa & Todd 1997a]. Prior work suggests that enjoyment directly affects the behavioral intention of online customers [Dick & Basu 1994; Prichard & Howard 1999]. Li et al. [2005] find that users who perceive the use of instant messaging as enjoyable are more likely to intend to continue using it. In the research grounded on the integrated theoretical framework of online consumer behavior, Koufaris [2002] finds that shopping enjoyment plays an important role in predicting consumer intention to

return to a Web-based store. Based on this finding, Koufaris [2002] argues that shopping enjoyment may be an important construct in research on online consumer behavior.

Prior research also suggests that enjoyment can indirectly impact behavioral intention through other variables. For example, in an anchoring and adjustment-based theoretical model of information technology use, Venkatesh [2000] examines determinants of perceived ease of use and finds that enjoyment significantly impacts behavioral intention to use information technology through perceived ease of use. In a study investigating students' acceptance of an Internet-based learning medium, Lee et al. [2005] find that enjoyment not only directly impacts behavioral intention but also indirectly influences it through attitude.

Enjoyment in the online gaming context can be viewed as the degree to which the activity of playing online games is perceived as enjoyable in its own right. Compared with other activities such as online shopping and information system uses, playing online games is more experience-oriented. Thus online game players are more likely motivated by the intrinsic motivations associated with playing online games. Moreover, one important motive for playing online games is to seek pleasure; players who experience enjoyment and the emotional response of pleasure are more likely to be motivated to play more [Huang & Cappel 2005; Kim et al. 2002]. Thus, we postulate that enjoyment received from playing online games influences players' intention to play.

Hypothesis 4: Online gaming enjoyment is positively related to intention to play online games.

Besides affecting consumers' behavioral intention, enjoyment is also found to shape consumer attitude toward online shopping [Eighmey 1997; Jarvenpaa & Todd 1997b]. Jarvenpaa and Todd [1997b] find that online consumers who perceive that their shopping experience is enjoyable will increase their favorable attitude toward online shopping. Similarly, Lee et al. [2005] empirically show that users who enjoy using Internet-based learning are more likely to have positive attitudes toward it. Following these findings, we argue that in the online gaming environment, enjoyment also influences player attitude toward playing.

In addition, players who perceive online games as enjoyable and pleasant are more likely to be satisfied. Thus, the satisfied players will probably give high overall evaluations of the outcome of playing online games and will expect beneficial outcomes. Therefore, they will develop a favorable attitude toward playing.

Hypothesis 5: Online gaming enjoyment is positively related to attitude toward playing online games.

3.4. The Impact of Subjective Norms on Intention

Subjective norms involve referent identification and norm compliance [Hsu & Lu 2004]. Referent identification occurs when an individual adopts an opinion held by people who are important to that individual. These important others may include friends, peer groups, coworkers, and schoolmates [Ahuja & Thatcher 2005; Brown & Venkatesh 2005; Cohen & Dennis 1993]. Norm compliance occurs when an individual performs some activities in accordance with the expectations of important others to strengthen relationships with them or to avoid their rejection and hostility [Deutsch & Gerard 1995]. In our current research, "some activities" refers to playing online games.

The TRA proposes that subjective norms affect behavioral intention. The proposed relationship is confirmed in recent online consumer behavior research. Njite and Parsa [2005] suggest that subjective norms have an effect on online purchase intention. Hsu and Lu [2004] identify a significant impact of subjective norms on intention to play online games. In a study examining pre- and post-adoption beliefs and attitudes, Karahanna et al. [1999] find that subjective norms have a stronger effect on behavioral intention for potential adopters than for users. Grounded in TRA and the previous empirical findings, we posit that, in the online gaming context, expectations of individuals who are important to a player (e.g., friends, coworkers, and schoolmates) influence the player's intention to play online games.

Hypothesis 6: Subjective norms are positively related to intention to play online games.

4. Methodology

4.1. Survey Instrument, Pilot Test, and Data Collection

We collected our research data via survey questionnaires. All research variables were measured using multi-item scales adapted from prior studies. To reduce the length of the questionnaire, we used only positively worded items. Although including negatively worded items may have reduced the risk of certain types of response biases, it may have also caused other problems. For instance, negatively worded items have been found to reduce a scale's internal consistency and obscure its dimensionality [Benson & Hocevar 1985; Goldsmith & Desborde 1991; Wong et al. 2003]. For those reasons, we chose to use only positively worded items in the 7-point Likert scales of the survey. Table 1 shows the survey instrument.

Table 1: Survey Items

Trust in Online Game Websites	Adapted from Koufaris and Hampton-Sosa [2004]
Trust1	Online game website is trustworthy.
Trust2	I believe in the information that online game website provides.
Trust3	Online game website does what it says.
Attitude toward Playing Online Games	Adapted from Agarwal and Prasad [1999]
Attitude1	It is a lot of fun to play online games.
Attitude2	I like to play online games.
Attitude3	Playing online games is attractive.
Online Gaming Enjoyment	Adapted from Koufaris [2002]
Enjoyment1	Playing online games is exciting.
Enjoyment2	I enjoyed playing online games.
Enjoyment3	Playing online games gives me a lot of pleasure.
Subjective Norms	Adapted from Hsu and Lu [2004]
SubjectiveNorm1	My friends believe that I should play online games.
SubjectiveNorm2	My coworkers believe that I should play online games.
SubjectiveNorm3	My schoolmates believe that I should play online games.
Intention to Play Online Games	Adapted from Agarwal and Karahanna [2000]
Intention1	I will play online games frequently in the future.
Intention2	I intend to play online games.
Intention3	I will play online games for a long time.

To ensure that questionnaire items were clearly articulated, we conducted a pilot test of the survey instrument using 26 online game players. We then modified our survey questions based on the comments and suggestions obtained from the pilot test participants.

The survey subjects of this research were undergraduate business students at a large public university in the eastern United States. While they may not be representative of the whole population of online game players, college students effectively make up an important age demographic of online games [Kirriemuir 2005]. Thus, the current study based on this group of subjects will still be informative and illuminating for online game researchers and practitioners. In total, 392 students were asked to complete the questionnaire with regard to the online game websites and the games they had used most. Of the 392 questionnaires, 139 were unusable either because respondents had no prior experience with online games or because their answers were incomplete. Inexperienced respondents were not included because lack of experience prevents them from giving a valid assessment of their online gaming enjoyment and their trust in online game websites. In the end, a total of 253 valid surveys were used for data analysis.

We summarize characteristics of the respondents in Table 2. Overall, about 40% of the respondents are female and 60% are male. The respondents spend an average of 3.2 hours per week playing online games, and their average online gaming experience is 2.8 years.

4.2 Psychometric Properties of Measures

We used a structural equation modeling (SEM) tool, Partial Least Squares (PLS) Graph Version 3.0, to measure the reliability and validity of data and to test the research model. Unlike covariance-based SEM tools such as LISREL, PLS has the flexibility to represent both formative and reflective latent constructs, and places minimal demands on measurement scales, sample size, and distribution assumptions [Chin 1998; Falk & Miller 1992; Fornell & Bookstein 1982; Lohmoller 1989]. This is because the component-based PLS uses a least-square estimation

procedure to obtain parameter estimates while LISREL uses a maximum likelihood function to do so [Chin 2001; Yi & Davis 2003].

Table 2: Characteristics of Respondent Students

Measure	Items	Percent	Average
Gender	Male	60.5	NA
	Female	39.5	
Age (years)	<20	2.8	23.2
	21-25	83.4	
	>25	13.8	
Place of playing online games	Home	74.2	NA
	School	7.3	
	Office	15.7	
	Friend's	1.4	
	Other	1.4	
Years of online game experience	<1	16.2	2.8
	1-3	51.4	
	4-5	20.9	
	>5	11.5	
Hours per week playing online games	<1	11.9	3.2
	1-5	71.1	
	>5	17	
Times per week playing online games	1-3	83.4	2.6
	4-5	10.3	
	>5	6.3	

We employed convergent and discriminant validity and internal consistency reliability (ICR) to evaluate the psychometric properties of the measures for the five latent constructs. The convergent and discriminant validity of latent constructs with reflective indicators can be assessed by using the following criteria. (1) The standardized item loadings (similar to loadings in principal components) should be no less than .707. (2) The items should load more strongly on their respective constructs than on other constructs. (3) The square root of average variance extracted (AVE) by a construct from its indicators should be no less than .707 (i.e., AVE should be no less than .50). (4) The square root of AVE should be larger than the correlations between that construct and all other constructs [Chin 1998; Compeau et al. 1999; Fornell & Larcker 1981].

ICR, also known as composite reliability, is similar to Cronbach's alpha because both are used to measure reliability [Yi & Davis 2003]. We compute ICR from the normal PLS output using the formula: $ICR = (\Sigma\lambda_i)^2/[(\Sigma\lambda_i)^2+\Sigma(1-\lambda_i^2)]$, where λ_i is the standardized component loading of an indicator on its construct [Chin 1998]. ICR will be considered adequate if its value is no less than .70 [Barclay et al. 1995; Compeau et al. 1999]. We obtain item loadings in the normal PLS output and obtain the cross-loadings by correlating five construct factor scores with all standardized item scores.

All fifteen items exhibit high loadings (>.707) on their respective constructs and load more strongly on their respective constructs than on other constructs. Table 3 shows the results.

Table 4 presents ICRs, square roots of AVEs, and correlations among latent constructs. ICRs are all higher than 0.90, exceeding the recommended minimum reliability criterion (.70). We obtained AVEs using the normal PLS output and the formula: $AVE=\Sigma\lambda_i^2/[\Sigma\lambda_i^2+\Sigma(1-\lambda_i^2)]$. All square roots of AVEs (on the diagonal in bold) are larger than .707 and larger than the correlations between that construct and all other constructs. In summary, the results in Tables 3 and 4 provide sufficiently strong evidence of reliability and convergent and discriminant validity of the measurement instruments.

Table 3: Loadings and Cross-Loadings

	Trust	Attitude	Enjoyment	Subjective Norms	Intention
Trust1	**0.85**	0.30	0.29	0.11	0.22
Trust2	**0.87**	0.24	0.22	0.14	0.21
Trust3	**0.88**	0.37	0.31	0.21	0.29
Attitude1	0.34	**0.93**	0.73	0.40	0.65
Attitude2	0.33	**0.94**	0.76	0.45	0.75
Attitude3	0.30	**0.84**	0.67	0.39	0.64
Enjoyment1	0.29	0.73	**0.90**	0.43	0.74
Enjoyment2	0.25	0.70	**0.89**	0.38	0.68
Enjoyment3	0.33	0.71	**0.90**	0.43	0.67
SubjectiveNorm1	0.19	0.44	0.45	**0.92**	0.51
SubjectiveNorm2	0.06	0.30	0.31	**0.85**	0.36
SubjectiveNorm3	0.21	0.46	0.47	**0.93**	0.51
Intention1	0.26	0.71	0.71	0.51	**0.94**
Intention2	0.27	0.72	0.77	0.48	**0.95**
Intention3	0.27	0.69	0.72	0.47	**0.93**

Table 4: ICRs, AVE Square Roots, and Correlations among Latent Constructs

Latent Construct	ICR	AVE Square Roots (on-diagonal) and Correlations (off-diagonal)				
		Trust	Attitude	Enjoyment	Subjective Norms	Intention
Trust	.90	**.87**				
Attitude	.93	.36	**.90**			
Enjoyment	.93	.32	.79	**.90**		
Subjective Norms	.93	.18	.46	.46	**.90**	
Intention	.96	.28	.75	.78	.52	**.94**

4.2.   Test of the Model and Hypotheses

The hypotheses are tested by examining path coefficients (similar to standardized beta weights in a regression analysis) and their significance levels in the PLS structural model. To examine the statistical significance of path coefficients, we performed bootstrapping with 500 resamples to obtain estimates of t-statistic values [Chin 1998].

Figure 2 shows path coefficients and significance levels for each hypothesis as well as the variances for the two dependent constructs: attitude toward playing and intention to play online games. Attitude toward playing online games, online gaming enjoyment, and subjective norms together explain 68% of the variance in intention to play. However, trust in online game websites makes almost no contribution to the variance in intention to play. Online gaming enjoyment alone explains 60% of the variance in attitude toward playing online games; the addition of trust increases the explained variance by only 4%.

Five of the six hypotheses are supported (see Table 5 for a summary of the results). Consistent with Hypothesis 2, trust in online game websites has a significant effect on attitude toward playing online games. Attitude toward playing online games has a significant effect on intention to play online games, supporting Hypothesis 3. Consistent with the predictions, online gaming enjoyment has a significant effect on intention to play as well as on attitude toward playing online games, thus supporting Hypotheses 4 and 5. Consistent with Hypothesis 6, subjective norms has a significant effect on intention to play online games. Finally, inconsistent with Hypothesis 1, trust in online game websites does not affect intention to play.
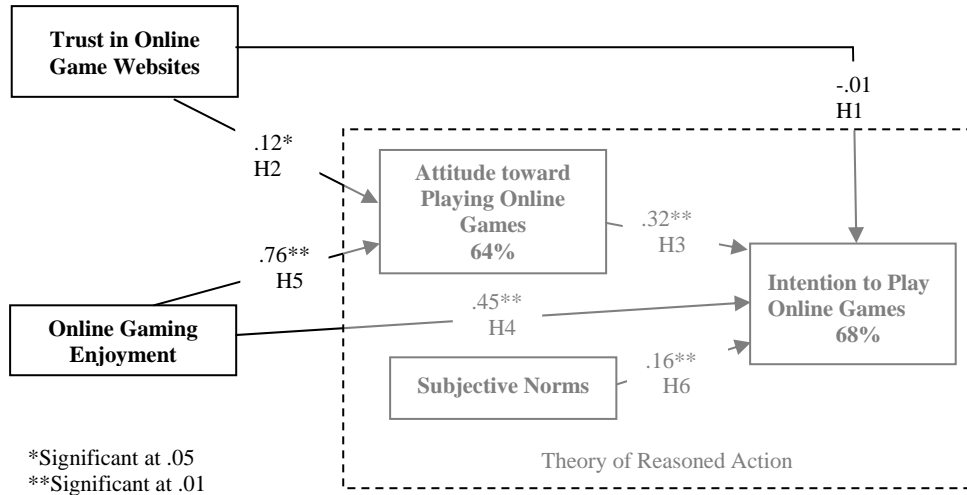
Figure 2: PLS Results

Table 5: Summary of Hypothesis Test Results

Hypothesis	T-Statistic	P-Value	Support
H1: Trust→Intention	0.20	.84	No
H2: Trust→Attitude	2.44	<.05	Yes
H3: Attitude→Intention	4.38	<.001	Yes
H4: Enjoyment→Intention	7.10	<.001	Yes
H5: Enjoyment→Attitude	19.75	<.001	Yes
H6: Subjective Norms→Intention	3.53	<.001	Yes

5. Discussion

5.1. Summary of Results

The current study shows that attitude toward playing online games, online gaming enjoyment, and subjective norms have an impact on intention to play online games. Online gaming enjoyment is the strongest predictor of intention to play. Both trust in online game websites and online gaming enjoyment greatly affect attitude toward playing online games. Again, in predicting attitude toward playing online games, online gaming enjoyment plays a more important role than trust in online game websites.

We also find that trust in online game websites does not have a direct effect on intention to play but it does have an indirect effect through attitude toward playing online games. The direct effect may be insignificant for the following reasons. First, we included questionnaire items measuring player trust in online game websites but no items measuring other aspects of trust, such as trust in online gaming technology. As a result, the trust construct used in the present study may not be powerful enough to predict online gaming intention. Second, the role of trust in online gaming intention may vary across websites. When users play on websites such as *Yahoo! Games* and *MSN Zone*, they generally do not have to pay. However, when they play on other websites, such as *War of Warcraft and Everquest*, they must pay a subscription fee. When players must pay for gaming, trust may be more important because they are more likely to be concerned about credit card fraud. Thus, the direct effect of trust on behavioral intention may be insignificant because a majority of our research participants use free online games.[1]

5.2. Contribution and Key Insights

A primary contribution of this study is that we highlight the roles of trust and enjoyment in the online gaming environment. Prior research in e-commerce examined the impact of trust and enjoyment on shopping intentions, assuming that trust in online retailer websites and shopping enjoyment would have an effect on intention to purchase

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[1] We thank an anonymous reviewer for providing the second explanation.

online. This study indicates that trust and enjoyment also exert important influences in players' intentions to play online games.

The present study shows that online gaming enjoyment not only has the strongest impact on intention but also plays a more important role in predicting attitude. This is consistent with prior studies in electronic commerce, providing additional evidence that enjoyment is an important trigger for behavioral intention [Jarvenpaa & Todd 1997a; Prichard & Howard 1999], and a critical predictor of behavioral attitude [Eighmey 1997; Jarvenpaa & Todd 1997b]. More important, this confirms Koufaris's [2002] prediction that, given online consumers are not simply website users, a simple construct such as behavioral enjoyment may be adequate to study online consumer behavior.

Third, this study tests the theory of reasoned action (TRA) in the context of entertainment-oriented information technology, while previous studies focus almost entirely on productivity-oriented information technologies such as word processing, spreadsheets, and operating systems. Consistent with the theory, players' attitude toward playing online games and their subjective norms are the two important determinants of their intention to play online games. Moreover, according to the research related to TRA, behavioral beliefs could be viewed as underlying an individual's attitude, and ultimately determine behavioral intentions via attitude [Ajzen & Fishbein 1980]. Thus, this study contributes additionally to the literature on TRA by confirming that trust, as one of those salient behavioral beliefs [Pavlou 2002], can influence behavioral intention indirectly through attitude.

6. Implications and Limitations
6.1. Implications for Future Research
This study is motivated by a need to understand the roles of trust and enjoyment in behavioral intention in the context of online gaming. Our research model and empirical results yield the following implications for future research.

First, Ajzen and Fishbein [1980] state that an individual's attitude toward a behavior is determined by the set of salient beliefs the individual holds about performing the behavior. That attitude then determines the intention of performing that behavior. This study confirms that statement and finds that, in the online gaming context, trust is one of those salient beliefs that significantly affects attitude but does not directly impact intention. The insignificance of the link from trust to intention indicates the need for future research to reexamine the role played by trust in predicting behavioral intention in the online gaming context. In addition, future research is needed to find whether other salient behavioral beliefs play the same role as trust.

Second, this study shows that online gaming enjoyment plays very significant roles in predicting intention and attitude. This implies that enjoyment as conceptualization of intrinsic motivation is important and appropriate in studying online game player behavior. Due to the importance of enjoyment in explaining behavioral intention, more research is needed to investigate predictors of enjoyment.

6.2. Implications for Practice
This study has key implications for practice. First, the findings suggest that enjoyment is an important antecedent to both behavioral intention and behavioral attitude, implying that game vendors must consider the element of enjoyment if they are to provide players with attractive products. When players achieve online gaming enjoyment, they are more likely to have positive attitudes toward playing online games and, most important, they will be motivated to return frequently. Second, this study shows that trust impacts behavioral intention indirectly through attitude. Such a finding implies that it is desirable for vendors to establish player trust in online game websites by ensuring that their websites perform in accordance with players' expectations, that information contained in their websites is accurate and believable, and that promises and commitments are kept.

6.3. Limitations
As with other survey research, interpretation of our results is subject to certain limitations. First, participants were asked to complete the questionnaires based on online game websites and online games they have used most. There is a possibility that most respondents based their answers on the same online game website or online game, which may throw bias into our results. In light of this, caution must be taken when interpreting our results. Second, some readers may consider family members of online gamers to be "important others" and thus should have been included in the measurement of subjective norms. However, we think that omitting family-member influence might have only limited impact because most of our subjects are undergraduate students who are hundreds of miles away from home and live in school dorms or in apartments around campus.[2] Finally, our subjects are business school undergraduates in a single educational institution, a condition that may potentially limit the applicability of

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[2] We thank an anonymous reviewer for raising this point.

our research findings in other settings or populations. Therefore, additional research is required to examine the generalizability of the model and its findings to a wide array of settings and populations.

7. Conclusion

In conclusion, this study was conducted to examine factors influencing behavioral intention in playing online games. Our research model and hypotheses are based on TRA and prior literature on trust and enjoyment. We surveyed students at an educational institution and found support for five of the six hypotheses. The results of this study confirm the important roles of attitude, enjoyment, and subjective norms in predicting behavioral intention, and emphasize the significant impact of trust and enjoyment on player attitude toward playing online games. The insignificance of the link from trust to intention indicates the need for further research on trust in the context of online gaming.

REFERENCES

Agarwal, R. and E. Karahanna, "Time Flies When You're Having Fun: Cognitive Absorption and Beliefs about Information Technology Usage," *MIS Quarterly*, Vol. 24, No. 4:665-694, 2000.

Agarwal, R. and J. Prasad, "Are Individual Differences Germane to the Acceptance of New Information Technologies?" *Decision Science*, Vol. 30, No. 2:361-391, 1999.

Ahuja, M.K. and J.B. Thatcher, "Moving beyond Intentions and toward the Theory of Trying: Effects of Work Environment and Gender on Post-Adoption Information Technology Use," *MIS Quarterly*, Vol. 29, No. 3:427-459, 2005.

Ajzen, I. and M. Fishbein, Understanding Attitudes and Predicting Social Behavior, NJ, Englewood Cliffs: Prentice-Hall, 1980.

Barclay, D., C. Higgins, and R. Thompson, "The Partial Least Squares Approach to Causal Modeling: Personal Computer Adoption and Use as an Illustration," *Technology Study*, Vol. 2:285-309, 1995.

Bart, Y., V. Shankar, F. Sultan, and G.L. Urban, "Are the Drivers and Role of Online Trust the Same for All Web Sites and Consumers? A Large-Scale Exploratory Empirical Study," *Journal of Marketing*, Vol. 69, No. 4:133-152, 2005.

Benson, J. and D. Hocevar, "The Impact of Item Phrasing on the Validity of Attitude Scales on Elementary School Children," *Journal of Educational Measurement*, Vol. 22, No. 3:231-240, 1985.

Blakney, V.L. and W. Sekely, "Retail Attributes: Influence on Shopping Mode Choice Behavior," *Journal of Managerial Issues*, Vol. 6, No. 1:101-118, 1994.

Brown, S.A. and V. Venkatesh, "Model of Adoption of Technology in Households: A Baseline Model Test and Extension Incorporating Household Life Cycle," *MIS Quarterly*, Vol. 29, No. 3:399-426, 2005.

Chin, W.W. PLS-Graph User's Guide Version 3.0. Houston, TX: C.T. Bauer College of Business, University of Houston, 2001.

Chin, W.W. "The Partial Least Squares Approach to Structural Equation Modeling," in Modern Methods for Business Research, G. A. Marcoulides (ed.), Lawrence Erlbaum Associates, Mahwah, NJ, pp. 295-336, 1998.

Claypool, M. and K. Claypool, "Latency and Player Actions in Online Games," *Communications of the ACM*, Vol. 49, No. 11:40-45, 2006.

Cohen, J. and M.H. Dennis, "An Analysis of Underlying Constructs Affecting the Choice of Accounting as a Major," *Issues in Accounting Education*, Vol. 8, No. 2:219-238, 1993.

Compeau, D.R., C.A. Higgins, and S. Huff, "Social Cognitive Theory and Individual Reactions to Computing Technology: A Longitudinal Study," *MIS Quarterly*, Vol. 23, No. 2:145-158, June 1999.

Csikszentmihalyi, M., Flow: The Psychology of Optimal Experience, New York: Harper & Row, 1990.

Davis, F.D., R.P. Bagozzi, and P.R. Warshaw, "User Acceptance of Computer Technology: A Comparison of Two Theoretical Models," *Management Science*, Vol. 35, No. 8:982-1003, 1989.

Davis, F.D., R.P. Bagozzi, and P.R. Warshaw, "Extrinsic and Intrinsic Motivation to Use Computers in the Workplace," *Journal of Applied Social Psychology*, Vol. 22:1111-1132, 1992.

Deci, E.L. and R.M. Ryan, Intrinsic Motivation and Self-Determination in Human Behavior, New York, NY: Plenum Press, 1985.

Deci, E.L., R. Koestner, and R.M. Ryan, "A Meta-Analytic Review of Experiments Examining the Effects of Extrinsic Rewards on Intrinsic Motivation," *Psychological Bulletin*, Vol. 125:627-688, 1999.

Deutsch, M. and H. Gerard, "A Study of Normative and Informational Social Influences upon Individual Judgment," *Journal of Abnormal and Social Psychology*, Vol. 51:624-636, 1995.

DFC Intelligence, http://www.dfcint.com/news/praug32004.html, 2004.

DFC Intelligence, http://www.dfcint.com/game_article/mar06article.html, 2006.

Dick, A.S. and K. Basu, "Customer Loyalty: Toward an Integrated Conceptual Framework," *Journal of the Academy of Marketing Science*, Vol. 22, No. 2:99-113, 1994.

Doney, P.M. and J.P. Cannon, "An Examination of the Nature of Trust in Buyer-Seller Relationships," *Journal of Marketing*, Vol. 61, No. 2:35-51, 1997.

Eighmey, J. "Profiling User Responses to Commercial Websites," *Journal of Advertising Research*, Vol. 37, No. 3:59-66, 1997.

Eighmey, J. and L. McCord, "Adding Value in the Information Age: Uses and Gratifications of Sites on the World Wide Web," *Journal of Business Research*, Vol. 41, No. 3:187-194, 1998.

Falk, R.F., and N.B. Miller, A Primer for Soft Modeling, The University of Akron, Akron, OH, 1992.

Fishbein, M. and I. Ajzen, Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research, MA, Addison-Wesley, 1975.

Forman, A.M. and V. Sriram, "The Depersonalization of Retailing: Its Impact on the 'Lonely' Consumer," *Journal of Retailing*, Vol. 67, No. 2:226-243, 1991.

Fornell, C. and L. Bookstein, "Two Structural Equation Models: LISREL and PLS Applied to Consumer Exit-Voice Theory," *Journal of Marketing Research*, Vol. 19:440-452, 1982.

Fornell, C. and D.F. Larcker, "Evaluating Structural Equations Models with Unobservable Variables and Measurement Error," *Journal of Marketing Research*, Vol. 18, No. 1:39-50, 1981.

Franzoi, S.L. Social Psychology, New York, McGraw-Hill, 2003.

Fukuyama, F., Trust: The Social Virtues and the Creation of Prosperity, New York: Free Press, 1995.

Gefen, D. "Customer Loyalty in E-Commerce," *Journal of the Association of Information Systems*, Vol. 3:27-51, 2002.

Gefen, D. "E-Commerce: The Role of Familiarity and Trust," *Omega*, Vol. 28, No. 5:725-737, 2000.

Gefen, D., E. Karahanna, and D.W. Straub, "Trust and TAM in Online Shopping: An Integrated Model," *MIS Quarterly*, Vol. 27, No. 1:51-90, 2003.

Goldsmith, R.E. and R. Desborde, "A Validity Study of a Measure of Opinion Leadership," *Journal of Business Research*, Vol. 22, No. 1:11-19, 1991.

Hansen, T., J.M. Jensen, and H.S. Solgaard, "Predicting Online Grocery Buying Intention: A Comparison of the Theory of Reasoned Action and the Theory of Planned Behavior," *International Journal of Information Management*, Vol. 24, No. 6:539-550, 2004.

Hilton, R. "Gaming as an Education tool," *Young Consumers*, Vol. 7, No. 2:14-19, 2006.

Hoffman, D.L., T.P. Novak, and M. Peralta, "Building Consumer Trust Online," *Communications of the ACM*, Vol. 42, No. 4:80-85, 1999.

Hsu, C.L. and H.P. Lu, "Why Do People Play On-line Games? An Extended TAM with Social Influences and Flow Experience," *Information & Management*, Vol. 41, No. 7:853-868, 2004.

Huang, Z. and J.J. Cappel, "Assessment of a Web-Based Learning Game in an Information Systems Course," *Journal of Computer Information Systems*, Vol. 45, No. 4:42-50, 2005.

Igbaria, M., J. Iivari, and H. Maragahh, "Why Do Individuals Use Computer Technology? A Finnish Case Study," *Information & Management*, Vol. 29, No. 5:227-238, 1995.

Igbaria, M., S. Parasuraman, and J.J. Baroudi, "A Motivational Model of Microcomputer Usage," *Journal of Management Information Systems*, Vol. 13, No. 1:127-143, 1996.

Jarvenpaa, S.L. and P.A. Todd, "Is There a Future for Retailing on the Internet?" in Electronic Marketing and the Consumer, R. A. Peterson (ed.), Sage, Thousand Oaks, CA., 1997a.

Jarvenpaa, S.L. and P.A. Todd, "Consumer Reactions to Electronic Shopping on the World Wide Web," *International Journal of Electronic Commerce*, Vol. 1, No. 2:59-88, 1997b.

Jarvenpaa, S.L. and N. Tractinsky, "Consumer Trust in an Internet Store: A Cross-Culture Validation," *Journal of Computer-Mediated Communication*, Vol. 5, No. 2, 1999.

Jarvenpaa, S.L., N. Tractinsky, and M. Vitale, "Consumer Trust in an Internet Store," *Information Technology and Management*, Vol. 1, No. 1-2:45-71, 2000.

Karahanna, E., D.W. Straub, and N.L. Chervany, "Information Technology Adoption across Time: A Cross-Sectional Comparison of Pre-Adoption and Post-Adoption Beliefs," *MIS Quarterly*, Vol. 23, No. 2:183-213, 1999.

Keen, P.G.W., Electronic Commerce Relationships: Trust by Design, NJ, Englewood Cliffs: Prentice-Hall, 1999.

Kim, K.H., J.Y. Park, D.Y. Kim, H.I. Moon, and H.C. Chun, "E-Lifestyle and Motives to Use Online Games," *Irish Marketing Review*, Vol. 15, No. 2:71-77, 2002.

Kimery, K. and M. McCord, "Third-Party Assurances: Mapping the Road to Trust in E-Retailing," *Journal of Information Technology Theory and Applications*, Vol. 4, No. 2:63-82, 2002.

Kirriemuir, J. "Parallel Worlds -- Online Games and Digital Information Service," *D-Lib Magazine*, 2005, http://www.dlib.org/dlib/december05/kirriemuir/12kirriemuir.html.

Kotler, P., Marketing Management, New Jersey: Prentice-Hall Inc, 2003.

Koufaris, M. "Applying the Technology Acceptance Model and Flow Theory to Online Consumer Behavior," *Information Systems Research*, Vol. 13, No. 2:205-223, 2002.

Koufaris, M. and W. Hampton-Sosa, "The Development of Initial Trust in an Online Company by New Customers," *Information & Management*, Vol. 41, No. 3:377-397, 2004.

Lee, M.K.O., C.M.K. Cheung, and Z. Chen, "Acceptance of Internet-Based Learning Medium: The Role of Extrinsic and Intrinsic Motivation," *Information & Management*, Vol. 42, No. 8:1095-1104, 2005.

Li, D., P.Y.K. Chau, and H. Lou, "Understanding Individual Adoption of Instant Messaging: An Empirical Investigation," *Journal of the Association for Information Systems*, Vol. 6, No. 4:102-129, 2005.

Lohmoller, J., Latent Variable Path Modeling With Partial Least Squares, Physica-Verlag, Heidelberg, 1989.

Mayer, R.C., J.H. Davis, and F.D. Schoorman, "An Integrative Model of Organizational Trust," *Academy of Management Review*, Vol. 20, No. 3:709-734, 1995.

McKnight, D.H. and N.L. Chervany, "What Trust Means in e-Commerce Customer Relationships: An Interdisciplinary Conceptual Typology," *International Journal of Electronic Commerce*, Vol. 6, No. 2:35-59, 2002.

McKnight, D.H. and N.L. Chervany, "While Trust is Cool and Collected, Distrust is Fiery and Frenzied: A Model of Distrust Concepts," *Proceedings of the Americas Conference on Information Systems*, pp. 883-888, August 2001.

McKnight, D.H., V. Choudhury, and C. Kacmar, "Developing and Validating Trust Measures for e-Commerce: An Integrative Typology," *Information Systems Research*, Vol. 13, No. 3:334-359, 2002.

McKnight, D.H., L.L. Cummings, and N.L. Chervany, "Initial Trust Formation in New Organizational Relationships," *Academy of Management Review*, Vol. 23, No. 3:472-490, 1998.

Morgan, R.M. and S.D. Hunt, "The Commitment-Trust Theory of Relationship Marketing," *Journal of Marketing*, Vol. 58, No. 4:20-38, 1994.

Njite, D. and H.G. Parsa, "Structural Equation Modeling of Factors That Influence Consumer Internet Purchase Intentions of Services," *Journal of Services Research*, Vol. 5, No. 1:43-59, 2005.

Pavlou, P.A. "Consumer Acceptance of Electronic Commerce: Integrating Trust and Risk with the Technology Acceptance Model," *International Journal of Electronic Commerce*, Vol. 7, No. 3:69-103, 2003.

Pavlou, P.A. "What Drives Electronic Commerce? A Theory of Planned Behavior Perspective," *Best Paper Proceedings of the Academy of Management Conference*, Denver, CO, 2002.

Pavlou, P.A. and Gefen, D. "Building Effective Online Marketplaces with Institution-Based Trust," *Information Systems Research*, Vol. 15, No. 1:37-59, 2004.

Pritchard, M.P. and D.R. Howard, "Analyzing the Commitment-Loyalty Link in Service Contexts," *Journal of the Academy of Marketing Science*, Vol. 27, No. 3:333-348, 1999.

Sheppard, B.H., J. Hartwick, and P.R. Warshaw, "The Theory of Reasoned Action: A Meta-Analysis of Past Research with Recommendations for Modifications and Future Research," *Journal of Consumer Research*, Vol. 15, No. 3:325-343, 1988.

Song, J. and F.M. Zahedi, "A Theoretical Framework for the Use of Web Infomediaries," in *Proceedings of the Eight Americas Conference in Information Systems*, J. DeGross (ed.), New York: ACM, pp. 353-396, 2002.

Teo, T.S.H., V.K.G. Lim, and R.Y.C. Lai, "Intrinsic and Extrinsic Motivation in Internet Usage," *Omega*, Vol. 27, No. 1:25-37, 1999.

Venkatesh, V. "Determinants of Perceived Ease of Use: Integrating Control, Intrinsic Motivation, and Emotion into the Technology Acceptance Model," *Information Systems Research*, Vol. 11, No. 4:342-365, 2000.

Williamson, O. E., The Economic Institutions of Capitalism, New York: Free Press, 1985.

Wong, N., A. Rindfleisch, and J.E. Burroughs, "Do Reverse-Worded Items Confound Measures in Cross-Cultural Consumer Research? The Case of the Material Values Scale," *Journal of Consumer Research*, Vol. 30, No. 1:72-91, 2003.

Yi, M.Y. and F.D. Davis, "Developing and Validating an Observational Learning Model of Computer Software Training and Skill Acquisition," *Information Systems Research*, Vol. 14, No. 2:146-169, 2003.

Yoon, S.J. "The Antecedents and Consequences of Trust in Online Purchase Decisions," *Journal of Interactive Marketing*, Vol. 16, No. 2:47-63, 2002.