

## Gender Differences in Continuance Intention of On-line Shopping Services\*

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Given the extensive role of IS in everyday life and the increasing presence of women in IS users, understanding gender differences in individual technology continuance usage decisions is an important issue. Nevertheless, much of the large body of research on gender differences has just examined mean differences between women and men in terms of abilities, usage habit, and traits. Even though lots of psychology studies have shown that women, more than men, were influenced by affective factors, gender-affection-continuance use linkage has not been examined in the context of on-line shopping services. Therefore, the primary purpose of this paper is to seek to examine gender differences in terms of influence of affective factor in the context of IS continuance use. Meanwhile, IS continuance has been an important subject of study in the IT research area. To date, to explain why and how users are motivated to continue to use on-line shopping services, lots of theory-based research such as expectation-confirmation model (ECM) has been proposed. In particular, various affective factors have been proposed to explain continuance use of on-line shopping services recently. Affective factors have been regarded as essential factors for increasing relational strength and satisfaction. Several affective factors have been studied by prior IS adoption and continuance studies. Among them are enjoyment and anxiety. In IS continuance research, positive affect has been commonly and narrowly conceptualized and measured as the enjoyment which a person derives from using computers. Hence, in this study, we introduced intimacy factor, which was conceptually related to the quality of interactions and relationships in previous research. It also has been regarded as essential factors for strengthening human relationships. As a result, we have observed gender effect while examining intimacy-continuance bond. As expected based on the previous literatures, women seem to be more sensitive in affective factors. The con-

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tribution point here is that we find evidence in the context of on-line shopping services.

**Keywords :** IT usage, continuance intention, intimacy, gender difference

## I . Introduction

Service-oriented businesses have become steady sources of value, superseding product-oriented businesses. In service-oriented businesses, a growing number of consumers have used on-line shopping services for more than a decade. Accordingly, the research of information systems (IS) continuance usage has received much attention. IS continuance is crucial because long-term viability of an IS and its eventual success depend on continuous use rather than first-time use [Karahanna *et al.*, 1999; Bhattacharjee, 2001]. IS continuance at an individual user level is also crucial to the survival of many on-line shopping service providers such as online retailers, online banks, and on-line travel agencies. To date, a tremendous number of on-line shopping services have appeared and disappeared. Evidently, on-line shopping service providers are very interested in identifying the conditions to create long-running on-line shopping services.

To explain why and how consumers are motivated to continue to use on-line shopping services, a lot of theory-based research works such as technology acceptance model (TAM) and expectation-confirmation model (ECM) have been proposed. Recently, various affective factors have made an attempt to explain continuance use of on-line shopping services. For instance, Lin *et al.* [2005] investigated that perceived playfulness contributes significantly to

consumers' intention to reuse a web site.

However, studies that have considered the human relationship perspective of IS continuance have been very rare. IS continuance studies have been formerly expected that consumers have prior interactions. If a relationship between a consumer and an on-line shopping service has been built up due to repetitive usage, then we could assume that affective as well as cognitive factors may contribute to explaining the consumers' continuous use. Moreover, continuance behavior and long-term relationship concept are alike in character. Both are affected by perceived quality of prior interactions [Verhoef *et al.*, 2002]. Continuance behavior may be different from initial acceptance and temporary use [Bhattacharjee, 2001]. Similarly, a long-term relationship is qualitatively different from a short-term relationship [Grayson and Ambler, 1999]. Verhoef *et al.* [2002] examined the effect of relational constructs on consumer referrals and the number of services purchased in this context. In light of this assumption, the legacy ECM and human relationship-related theoretical models which include affective factors may be integrated for better explanation. Among the affective factors, intimacy was conceptually related to the quality of interactions and relationships in previous research. It also has been regarded as an essential factor for strengthening human relationships.

Therefore, this research aims to deepen our understanding of the underlying phenomena

of technology continuance usage decisions by focusing on differences in emotional sensitivity of men and women. Given the extensive role of IS in everyday life and the increasing presence of women in IS users, understanding gender differences in individual technology continuance usage decisions is an important issue. Nevertheless, much of extensive research on gender differences has examined mean differences between women and men in terms of abilities, traits, and psychological constructs. Even though there has also been research focusing on gender differences in IS usage [Gefen and Straub, 1997; Venkatesh *et al.*, 2000; Ahuja and Thatcher, 2005], very few studies have considered IS continuance usage. Meanwhile, many psychology researches have shown that women, more than men, were influenced by affective factors [Chentsova-Dutton and Tsai, 2007]. Hence, we seek to examine gender differences in terms of influence differences of cognitive and affective factors in the context of IS continuance usage.

To better understand gender-related issues, it is important to recognize that there are at least two commonly understood definitions of gender in psychology: the first is consistent with biological sex; the second views gender as a psychological construct [Bem, 1981]. To achieve our two objectives, we defined gender as biological sex.

The remainder of the paper proceeds as follows. The next section presents the theoretical background. The detailed research model and hypotheses are then described in Section 3. In Section 4, we present the research methodology of our empirical study. In Section 5, we discuss

some issues with a summary of future research plan.

## II. Research Background: The Role of Gender in IT Usage Research

Some prior IT research has considered gender differences in the context of IT usage. Clearly, studies have found dramatic differences between the sexes. Those studies can be roughly divided into the theory-based analytic study and the descriptive study. In the theory-based approach, various theories have been adopted such as IT diffusion theory, a theory of planned behavior (TPB), a theory of trying and Technology Acceptance Model (TAM). Gefen and Straub [1997] added gender to an IT diffusion model to extend the TAM model [Davis, 1989]. Venkatesh *et al.* [2000] investigated gender differences in individual adoption and sustained usage of technology by using the TPB. Ahuja and Thatcher [2005] also examined the influence of gender on the effort to innovate with IT grounded in the theory of trying. Ong and Lai [2006] explored gender differences in perceptions and relationships among dominants affecting e-learning acceptance based on the TAM. Additional evidence for gender differences through various descriptive studies has been proposed. For instance, Li and Kirkup [2007] investigated differences in use of, and attitudes toward the Internet and computers generally Chinese and British students. Their result showed that men were more self-confident about their computer skills than women, and men were more likely to express their opinion

&lt;Table 1&gt; Summary of previous research on gender differences in IS usage

Study	Context	Background Theory	Key Constructs
Gefen and Straub [1997]	Perception and use of e-mail	IT diffusion model	Perceived social presence Information richness of the medium Perceived usefulness Perceived ease of use
Venkatesh <i>et al.</i> [2000]	Individual adoption and sustained usage of technology in the working place	Theory of planned behavior (TPB)	Attitude toward Behavior, Subjective Norm Perceived Behavioral Control
Ahuja and Thatcher [2005]	Relationship between perceptions of the environment and trying to innovate with IT	Theory of trying	Autonomy, Overload, Autonomy/Overload interaction, Trying to innovate
Ong and Lai [2006]	Perceptions and relationships among dominants of e-learning acceptance	Technology Acceptance Model (TAM)	Self-efficacy Perceived usefulness Perceived ease of use Behavioral intention to use
Spotts <i>et al.</i> [1997]	Use of instructional technologies in a university faculty group	Survey data	Knowledge and experience Time to learn a technology Ease of use, training, available Information in discipline, incentives
Bimber [2000]	Presence on the Internet	Survey data	Socioeconomic status Gender-specific factor
Ono and Zavodny [2005]	Technology usage (use of computers and the Internet in United States and Japan)	Survey data	Employment status Type of employment
Li and Kirkup [2007]	Use of, and attitudes toward the Internet and computers cross-cultural context (Chinese and British students)	Survey data	Internet experience and usage patterns (frequency of internet use) Internet confidence and skills, attitudes toward the Internet
Imhof <i>et al.</i> [2007]	Computer use	Survey data	Computer access, computer use, and motivational variables

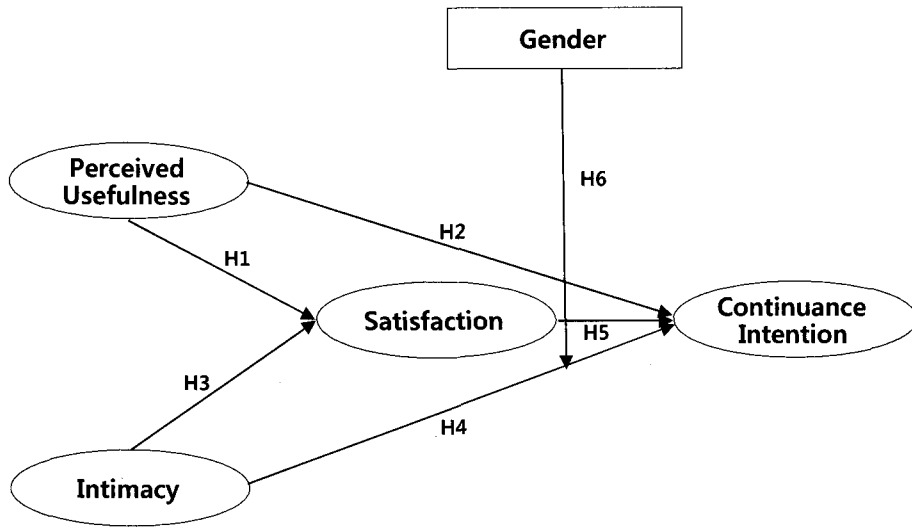
that using computers was a male activity than women were. <Table 1> summarizes the previous research results on gender differences in IS usage.

Through the research review, we found that, unfortunately, the effect of gender roles on IS continuance has been investigated only recently [Venkatesh *et al.*, 2000; Ahuja and Thatcher,

2005]. Even so, those studies are very rare.

### III. Hypotheses and Research Model

<Figure 1> shows the research model. Here, we propose an extended ECM which contains affective factor as well as cognitive factor re-



<Figure 1> Research Model

lated to maintaining relationship between consumers and service providers to explain why the consumers continue to use a specific on-line shopping service.

We identify perceived usefulness as the major construct in representing the cognitive factor following previous research [Bhattacharjee, 2001; van der Heijden, 2004]. Moreover, IS service users would seek to gain useful on-line shopping services to make their consumption experience valuable. In contrast, while other factors such as ease of use may influence the initial adoption decision of on-line shopping service users [Kim *et al.*, 2007], they may play a less critical role in deciding continued usage and post-adoption behavior toward on-line shopping services [Bhattacharjee and Premkumar, 2004]. Accordingly, this study proposes only one cognitive factor, namely, perceived usefulness.

Meanwhile, we propose intimacy as the major construct in representing the affective fac-

tor. IS continuance studies are formerly expected that users have several prior interactions. If a kind of relationship between consumers and on-line shopping services has been built up due to repetitive usage, then we could assume that affective factors which are related to forming a relationship may contribute to explaining consumers' continuous use. Moreover, continuance behavior and long-term relationship concept are alike in character. Both are affected by perceived quality of prior interactions [Geyskens *et al.*, 1999; Grayson and Ambler, 1999; Verhoef *et al.*, 2002]. Continuance behavior is different from initial acceptance and temporary use [Bhattacharjee, 2001]. Similarly, long-term relationship is qualitatively different from short-term relationship [Grayson and Ambler, 1999]. Verhoef *et al.* [2002] examined the effect of relational constructs on consumer referrals and the number of services purchased in this context. In light of these arguments, legacy ECM and human relationship-related theoret-

ical models which include affective factors; they may be integrated for better explanation. Intimacy was conceptualized as the quality of interactions and relationships in previous research [Laurenceau *et al.*, 1998]. It also has been regarded as an essential factor for strengthening human relationships in consumer behavior and social psychological literature [Mathieson, 1991; Wellman, 2001]. Accordingly, this study proposes this affective factor, intimacy.

In conclusion, this study mainly considers intimacy as a new affective construct. This research model also investigates the hypotheses that there are gender differences in the relationships with respect to perceived usefulness-continuance intention and intimacy-continuous intention. The model will be applied to the context of online shopping services.

### 3.1 Perceived Usefulness

Perceived Usefulness (PU) is defined as “the degree to which a user believes that the use of the system will result in benefits being accrued to the user or the user’s organization, and often benefits include increases in job performance and productivity” [Davis, 1989; Seddon, 1997]. According to ECM, users’ satisfaction with information technology is determined by the users’ perceived usefulness of the information technology. Based on ECT, ECM posits users’ perceived usefulness of information technology has a positive effect on their satisfaction with information technology by working as a baseline for reference against confirmation judgments. Hence, we assume that users’ perceived usefulness of an on-line shopping service use has a positive influence on their sat-

isfaction with the on-line shopping service use.

*H1: Users’ perceived usefulness of an on-line shopping service use has a positive effect on their satisfaction with the on-line shopping service use.*

Meanwhile, perceived usefulness has been regarded as a factor that is positively related to usage [Venkatesh and Davis, 2000]. The IT adoption studies have consistently found that perceived usefulness is one of the most important determinants of users’ adoption intentions [Davis, 1989; Taylor and Todd, 1995; Venkatesh and Davis, 2000]. ECM also admits that users’ perceived usefulness of IT has a positive effect on their intention to use the IT in a continuous manner. Hence, we would expect that there is a positive causality between users’ on-line shopping service continuance intention and their perceived usefulness of the on-line shopping service use.

*H2: Users’ perceived usefulness of an on-line shopping service use has a positive effect on their on-line shopping service continuance intention.*

### 3.2 Intimacy

Intimacy is generally conceived as knowing and being known by one another, which incorporates mutual and reciprocal liking and vulnerability. In previous social psychological research, intimacy was conceptualized as the quality of interactions and relationships [Laurenceau *et al.*, 1998], or as an enduring motivation to experience closeness, warmth and communication [Mathieson, 1991]. It was regarded as not

only an important measure of tie strength [Marsden and Campbell, 1984], but also an essential part of tie formation [Wellman, 2001]. Although we found a variety of conceptualizations on intimacy in the literatures, intimacy has been commonly studied as a tool for assessing closeness of relationships or as an essential factor for maintaining relationships. In other words, intimacy has been regarded as an essential aspect of interpersonal relationship and maintaining relationship. Schaefer and Olson [1981] reported that intimacy plays an integral role in solidification of a relationship.

Meanwhile, as the importance of forming a relationship in marketing has received considerable research attention in the marketing area, a number of researches on intimacy between service providers and consumers have been studied [Reis and Shaver, 1988; Stern, 1997]. These studies argued that intimacy could be successful in strengthening and improving business relationships. If service providers can invoke feelings of connection and intimacy-where consumers feel understood, cared for, and validated-through marketing activities such as advertising, a stronger bond and sense of loyalty are likely to follow. Various studies reported positive effects of intimacy on relationship. Grayson and Ambler [1999] showed that perceived intimacy or quality of interactions with the advertising agency affected clients' use of services in long-term relationships. Jap and Ganesan [2000] investigated that intimacy has a positive effect on relationship continuance in channels. Verhoef *et al.* [2002] examined the effect of commitment-based intimacy on consumer referrals and the number of services purchased. In IS research, Bickmore and Picard [2004] studied es-

tablishing and maintaining long-term human-computer relationship. They argued that the relationship could be maintained when emotional support such as intimacy is provided.

Also, a considerable body of research in both personality psychology and close relationships has shown the importance of intimacy to satisfaction. Relationship satisfaction is enhanced when individuals have greater emotional involvement in their relationships [Rubin *et al.*, 1980] and engage in self-disclosure, trust, and interdependence with their partners [Hansen, 1981; Reis and Shaver, 1988]. In contrast, relationships with little intimacy are more prone to dissolution [Hansen, 1981; Hendrick *et al.*, 1988]. Thus, creating intimacy in a relationship plays an important role in satisfaction. Given the importance of intimacy in creating satisfying and lasting relationships, individuals who are particularly focused on the pursuit of intimacy in their relationships should experience greater satisfaction than those without such a focus. Additionally, Lin *et al.* [2005] argued that an affective factor is positively associated with users' satisfaction.

Based on these arguments, we set up a hypothesis as follows:

*H3: Intimacy with on-line shopping services has a positive effect on users' satisfaction with the on-line shopping service use.*

*H4: Intimacy with on-line shopping services has a positive effect on users' on-line shopping services continuance intention.*

### 3.3 Satisfaction

Satisfaction is generally defined as "a pos-

itive affective state resulting from a global evaluation of performance based on past purchasing and consumption experience" [Szymanski and Henard, 2001; Lam *et al.*, 2004]. The ECT suggested that satisfaction with a product or service is the primary motivation for its continuance [Oliver, 1980]. Following the ECM, users' satisfaction with IT has a positive effect on their IS continuance intention.

Moreover, satisfaction is one of the most important concepts in marketing of services as well as products. Danaher and Rust [1996] found empirical evidence that a customer who is satisfied with a service will have higher subsequent use. Bolton and Lemon [1999] empirically demonstrated that customers with higher levels of satisfaction would have higher usage than customers with lower levels of satisfaction. Szymanski and Henard [2001] also suggested that the overall satisfaction experienced by online customers reduced the perceived benefits of switching to other e-retailers. By building upon this line of argument, we would expect that users' level of satisfaction with the initial on-line shopping service use has a positive influence on their on-line shopping service continuance intention.

*H5: Users' level of satisfaction with the initial on-line shopping service use has a positive effect on their on-line shopping service continuance intention.*

### 3.4 Gender Differences in Emotional Sensitivity

In general, males and females are likely to differ in information and decision making

processes [Kring and Gordon, 1998]. The growing predominance of the Internet use has further highlighted the need for understanding online users' attitudes and behaviors from a gender perspective. Reflecting this research need, this study examines gender differences within the context of online shopping website continuance use behavior.

Researchers have discovered various facts which can support the idea that there are gender differences in how cognitive and affective factors influence users in the context of IS continuance usage. We found much evidence converging to support our hypothesis; our findings can be summarized into three perspectives.

First perspective is related to the results of brain science research. The human brain is divided into two hemispheres, and lateralization refers to the specialization in the functioning of each hemisphere; the left hemisphere specializes in verbal abilities and the right hemisphere specializes in spatial perception [Hansen, 1981]. In regard to emotion, a man's emotion is located in two areas of the right side of the brain [Gorman *et al.*, 1992]. Located in only one side, men's emotions can operate separately from the other brain functions. On the other hand, a woman's emotions are located in both hemispheres of the brain, making her more able to "switch her emotions on" while her brain performs other functions.

The brain lateralization differences attributed to the sexes are also likely to influence IS evaluation and judgment. It would be assumed that the cognitive gender differences influence IS users' continuance use behavior on the on-line shopping website. If women tend to judge IS based on their emotion more than men do,



then they are more influenced by emotional factors than men are.

Second one is related to the relation between gender and memory. In recent years, there has been a growing interest in this issue. A number of studies demonstrate that men and women remember memory personal experiences and laboratory materials differently in quantitative and qualitative ways. Those studies found that women recall more memories of both positive and negative personal experiences than men when asked to recall emotional life experiences [Seidlitz and Diener, 1998]. Women may remember more emotional information because they have more frequent or more intense emotional experiences than men; or men and women may have, on average, experiences similar in frequency and emotional intensity, but emotional information may be more salient to women and hence better attended and remembered. It would be assumed that women are influenced by emotional factors more strongly than men are.

Final perspective is related to the influence of gender on the interplay between cognitive and emotional processes. The interplay between cognitive and emotional processes has become a topic of major interest [Vuilleumier, 2005]. Women are generally regarded as "more emotional" than men. Women are more vulnerable to disorders that affect emotions [Sloan and Kornstein, 2003] and have been found to display stronger emotion-specific physiological responses during emotion processing [Kring and Gordon, 1998; Labouvie-Vief *et al.*, 2003]. Men, on the other hand, have been shown to be better able to cognitively control negative emotions [Birditt and Fingerman, 2003] or to be

more prone to use cognitive control strategies to counter negative affect [Thayer *et al.*, 1994]. Hence, gender-associated differences with regard to cognitive-emotional interplay or the ability to cognitively regulate emotional states seem plausible and invite analysis. If women focus on the emotional aspects of the environment more than men do, then they should be influenced by emotional factors more than men are.

Based on these arguments, we set up a hypothesis as follows:

*H6: The impact of intimacy on users on-line shopping services continuance intention will be different by gender.*

## IV. Research Method

### 4.1 Data Collection

The study was conducted in the context of a web-based shopping service. A survey technique was used to collect data. Data was collected from among individual users who are using commercial web-based shopping service. We offered respondents small cash prizes as an incentive. We obtained a total of 420 usable survey responses out of 473 for seventeen days (from 12 June to 29 June, 2009) through a questionnaire survey. The gender distribution was fairly equal with 50.4% males and 49.6% females. The participants' ages ranged from twenties to forties (96.3%). Also, 75% of them were employed so we can assure their economic prospects. Moreover, most of the respondents (72.5%) were comfortable with shopping online. Hence, the responses seem to be qualified

to analyze the factors affecting the continuance use of web-based shopping service.

## 4.2 Measurement

To examine the research model, we have established a questionnaire for our study. Most of the items adopted in the questionnaire have been successfully used in other literatures. Out of the collected items, some items are omitted if they are conceptually far from service context. <Table 2> shows the selected items and their references.

Measurements for continuance intention (CONT) and satisfaction (SAT) were developed from Bhattacharjee's and Tsai and Huang's studies, based on Mathieson's study and Bhattacharjee's study, with some modifications to fit the specific context of the online shopping service. Measurement for perceived usefulness (PU) was adopted from Bhattacharjee's study and the study of Lin *et al.* [2005] based on Davis's prior study. We newly added the intimacy factor to the legacy ECM model. Measurement for intimacy (INT) was originated by Tomasi's study and modified to fit the specific context of the

<Table 2> Measurement instrument

Construct	Measure	Reference
Continuance intention	CONT1: I intend to continue using this online store rather than discontinue its use. CONT2: My intentions are to continue using this online store than use any alternative online shopping sites. CONT3: I consider this online store as my first choice for online shopping. CONT4: I will do more business with this online store in the near future.	Bhattacharjee [2001] Tsai and Huang [2007]
Satisfaction	SAT1: I am satisfied with my decision this online store use. SAT2: My choice to use this online store was a wise one. SAT3: Overall, this is a good online store to do shopping with. SAT4: My choice to purchase from this online store was a wise one.	Bhattacharjee [2001] Tsai and Huang [2007]
Perceived usefulness	PU1: Using this online store enhances my effectiveness in purchasing products what I need. PU2: Overall, this online store is useful in purchasing products what I need. PU3: Using this online store enables me to access a lot of useful information about products what I need. PU4: Using this online store gives me more convenience.	Bhattacharjee [2001] Lin <i>et al.</i> [2005]
Intimacy	INT1: I do not pay attention to this online store's inner components and process. INT2: When I want to buy something, I usually visit this online store without conscious. INT3: I feel close to this online store. INT4: My relationship with this online store is important in my shopping life.	Tomasi [2007] Newly added

online shopping service.

All items were measured with 7-point Likert scale with anchors from "Strongly disagree" to "Strongly agree."

We selected online stores from many kinds of on-line shopping services, just because usage experiences on online stores tend to be longer than any other on-line shopping services such as social networking service or blogging service, and hence continuance intention behavior could be observed in a richer manner. The findings from online shopping cases are expected to give insight into explaining the continuance intention of other on-line shopping services in the future.

## V. Results

The data were subjected to a confirmatory factor analysis using the AMOS 7.0 structural equation modeling software. Following Anderson and Gerbing's [1988] work, the model was tested using a two-stage structural equation model. First, we performed Confirmatory Factor Analysis (CFA) to evaluate construct validity regarding convergent and Discriminant validity. Second, we performed a structural equation analysis to test research hypotheses

empirically.

### 5.1 Validation

The confirmatory factor analysis was completed with maximum likelihood estimation. In this study, no item was deleted because item factor loading was higher than 0.7. The measurement model offered an acceptable fit to the data ( $\chi^2 = 181.540$ ,  $df = 83$ ).  $\chi^2/df = 2.187$ ,  $p = 0.000$ ,  $GFI = .948$ ,  $CFI = .981$ ,  $RMSEA = .053$ ). The fitness indexes of the research structure model are arranged in <Table 3>. The model suggested in the study is judged to be appropriate to estimate the relations among the variables as the result shows the satisfactory level. Item factor loadings, squared multiple correlations, and reliability from the confirmatory factor analysis completed on the data collected in internet shopping mall service recovery perception is shown in <Table 4>.

Discriminant validity was established using the procedures outlined by Fornell and Laker [1981]. <Table 4> shows the correlations between the latent variables, and the average variance extracted (AVE) of each construct is shown on the diagonal. Fornell and Lacker [1981] prescribe that the squared correlation

<Table 3> Fit Indices for Measurement and Structural Model

Goodness-of-fit measure	Recommended value*	Structural Model
Chi-square/degree of freedom	$\leq 5.00$	2.19
Goodness-of-fit (GFI)	$\geq 0.90$	0.95
Adjusted goodness-of-fit (AGFI)	$\geq 0.90$	0.92
Normalized fit index (NFI)	$\geq 0.90$	0.97
Non-normalized fit index (NNFI)	$\geq 0.90$	0.97
Comparative fit index (CFI)	$\geq 0.90$	0.98
Root mean square error of approximation (RMSEA)	$\leq 0.10$	0.05

Note) \* Recommended values have been adapted since Bentrler [1989] and Hair *et al.* [1998].

&lt;Table 4&gt; Factor Loadings, Squared Multiple Correlations (SMC) and Reliability

Constructs	Items	Factor loading	Error	SMC	Reliability	AVE
Perceived Usefulness	PU1	.913	.193	.833	0.825	0.546
	PU2	.731	.650	.535		
	PU3	.625	.957	.390		
	PU4	.883	.312	.780		
Intimacy	INT1	.741	.178	.549	0.850	0.505
	INT2	.909	.348	.826		
	INT3	.879	.529	.773		
	INT4	.743	.837	.552		
Satisfaction	SAT1	.836	.436	.699	0.897	0.687
	SAT2	.914	.250	.836		
	SAT3	.883	.318	.779		
	SAT4	.855	.386	.731		
Continuance Intention	CONT1	.762	.891	.581	0.815	0.526
	CONT2	.709	.238	.503		
	CONT3	.794	.701	.631		
	CONT4	.878	.409	.771		

between constructs must be less than the average variance extracted (AVE) of each underlying construct in order for the constructs to have discriminant validity. In this research, there was no case in which the square of a correlation between constructs was greater than average variance extracted from the constructs (see <Table 4>). Fornell and Lacker [1981] also suggest that convergent validity exists when item factor loading is greater than 0.5. In this study, no item was deleted as we mentioned. Subsequently, a confirmatory factor model was tested. The resulting statistics was a strong evidence of both discriminant (see <Table 5>) and convergent validity (see <Table 6>). On the basis of these results, this study summed the scores on the items of each construct. The correlation matrix is shown in <Table 5>.

## 5.2 Hypotheses testing

The followings are the overall model fit and the tests of each research hypotheses. As shown, the results of the full model (structural and measurement models) indicated fit indices:  $\chi^2 = 197.526$ ,  $df = 82$ ,  $\chi^2/df = 2.409$ ,  $p = .000$ ,  $GFI = .942$ ,  $AGFI = .904$ ,  $NFI = .962$ ,  $NNFI = .967$ ,  $CFI = .977$ ,  $RMSEA = .058$ . The adequacy of the structural equation models was evaluated on the criteria of overall fit with the data.

Next, we evaluated the individual paths of the model. These results are summarized in <Table 6>, and the following <Figure 2> is a path figure showing the AMOS analysis result of the research model suggested in this study.

Behavioral intention towards on-line shopping service continuance is predicted by per-

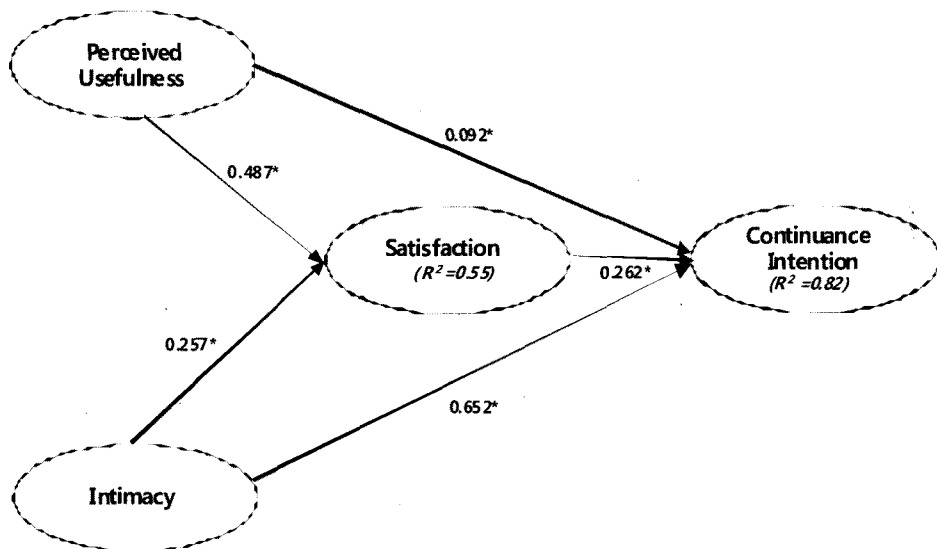
<Table 5> Correlation Matrix

	$\sqrt{AVE}$	Perceived Usefulness	Intimacy	Satisfaction	Continuance Intention
Perceived Usefulness	0.739	0.546*			
Intimacy	0.711	0.582	0.505*		
Satisfaction	0.829	0.758	0.592	0.687*	
Continuance Intention	0.725	0.679	0.837	0.712	0.526*

Note) \* = AVE.

<Table 6> Path Model Results

Paths	Estimate	S.E	t-value	Assessment (p<0.05)
H1 (PU → SAT)	.487	.072	6.783	H1 was supported
H2 (PU → CONT)	.092	.044	2.077	H2 was supported
H3 (INT → SAT)	.257	.047	5.471	H3 was supported
H4 (INT → CONT)	.652	.050	13.004	H4 was supported
H5 (SAT → CONT)	.262	.055	4.727	H5 was supported



<Figure 2> Standardized AMOS Solution (∴ p < 0.05)

ceived usefulness ( $\beta = 0.092$ ), satisfaction ( $\beta = 0.262$ ) and intimacy ( $\beta = 0.652$ ), which jointly explained 82% of the variance in intention. As exhibited in prior research, satisfaction is the one of significant motivators of behavior intention. However, it also reveals that more affective factor concerning user intimacy is an important indicator of continuance intention. The affective factor has stronger effect than a cognitive factor such as perceived usefulness. This shows that affective factors should be the first consideration for system engineers when building user loyalty. Comparing the results with prior ECM-based studies in IS continuance, the impact of perceived usefulness and satisfaction on intention are similar to what had been indicated in Bhattacharjee [2001], whereas the explanatory power of the current research model is much higher than the previous model was. It is possibly because intimacy devotes its direct effect to explain the error variance in intention.

Customer satisfaction is predicted by perceived usefulness ( $\beta = 0.487$ ) and intimacy ( $\beta = 0.257$ ) with 55% of the total variance explained. The influence of perceived usefulness on continuous intention is significant. This result is evidently consistent with the finding of Bhattacharjee [2001], which indicated that perceived usefulness should have a significant impact on continuous intention.

### 5.3 Gender differences

This research examined the moderating effect using "moderating effect analysis method of qualitative variables" suggested by Kim [2007]. The hypothesis related to the moderating effect is H6 (The impact of intimacy with web-based

on users' on-line shopping services continuance intention will be different dependent on gender).

The judgment procedure for the moderating effect by gender between intimacy and continuance intention was as following:

1. The model relevance of the whole group should be judged first. After the relevance of the whole model is secured, the next procedure will be followed.
2. Relevance is judged through a model analysis of each individual group.
3. Par variables of each group on the path, in which the researcher is interested, should be confirmed.
4. Relationship loose cross validation test will be done to confirm the loose cross validation in two or more groups, without presumption that may restrict the path of a specific group through the par value of matrix in each group. If the critical ratio of matrix is bigger than  $\pm 1.96$ , the null hypothesis, that the path coefficients are same in two groups, is rejected. In other words, it is interpreted that there is no loose cross validation in two groups.

The AMOS analysis was done through the procedure. The analysis result of the whole group was  $\chi^2 = 197.526$ ,  $df = 82$ ,  $\chi^2/df = 2.409$ ,  $p = .000$  and the null hypothesis that the model is relevant was adopted. Then, the group was classified into male and female to judge the moderating effect by gender. The AMOS analysis result was global  $\chi^2 = 303.797$ ,  $df = 164$ ,  $\chi^2/df = 1.852$ , and  $p = .000$  for the two groups, and the null hypothesis that the model is rele-

vant was adopted. The path coefficient between intimacy and continuance intention of male group was 0.545. The path coefficient between intimacy and continuance intention of female group was 0.834.

In the AMOS output estimate, it was possible to confirm the path coefficient label "Par-16" between intimacy and continuance intention of male group. The path coefficient label between intimacy and continuance intention of female group was "Par-50."

Pairwise parameter comparisons result among AMOS output was checked in order to confirm the significance. <Figure 3> shows the pairwise parameter comparisons result. The labels par-16 and par-50 from each group met at the value of 2.617. This value is the critical ratio of two path coefficients. Since it is bigger than  $t (\pm 1.96)$ , it was possible to confirm that the path coefficient between groups is statistically signi-

ficant. It was possible to confirm that there is no loose cross validation between two groups.

In conclusion, the impact of intimacy with web-based on users' on-line shopping services continuance intention is different dependent on gender (H6 was supported). This result also indicates that women are influenced by an affective factor (intimacy) more than men are.

## VI. Discussion

On-line shopping services have been in practice for more than a decade, and many providers have disappeared or at least reformed. Identifying what gives rise to the continuance use of on-line shopping services is a matter of great concern to the service providers. Based on actual evidences, we understand that cognitive factors themselves cannot fully explain the longevity of on-line shopping services without

Pairwise Parameter Comparisons (Default model)

Critical Ratios for Differences between Parameters (Default model)

	par_1	par_2	par_3	par_4	par_11	par_12	par_13	par_14	par_15	par_16	par_17
par_1	.000										
par_2	-.861	.000									
par_3	1.988	3.134	.000								
par_4	.688	1.373	-1.214	.000							
par_5	1.020	1.651	-.880	.847							
par_6	.291	1.002	-1.381	-.591							
par_7	1.267	1.963	-1.019	.427							
par_8	2.003	2.588	-.451	1.136							
par_9	.652	1.437	-1.492	-.162							
par_10	.808	1.512	-1.178	.085							
par_40	-.161	.717	-2.084	-.920	-1.742	-1.497	2.701	5.190	5.756	2.777	6.979
par_41	1.747	2.372	-.653	.887	-.141	.356	4.449	7.902	8.374	5.166	9.952
par_42	2.337	2.871	-.179	1.464	.386	.962	4.943	8.560	9.002	5.813	10.615
par_43	1.390	2.065	-.908	.554	-.429	.016	4.117	7.341	7.835	4.690	9.321
par_44	-.109	.830	-2.169	-.947	-1.827	-1.595	2.970	6.083	6.651	3.251	8.228
par_45	.175	1.003	-1.808	-.590	-1.438	-1.150	2.981	5.545	6.096	3.134	7.331
par_46	-.067	.848	-2.103	-.886	-1.756	-1.511	2.946	5.895	6.463	3.181	7.939
par_47	-3.147	-1.965	-4.453	-3.780	-4.339	-4.404	-.113	1.250	1.901	-.784	2.743
par_48	-4.789	-3.233	-5.808	-5.434	-5.867	-6.217	-1.232	-.072	.716	-2.340	1.623
par_49	-5.017	-3.498	-5.997	-5.637	-6.056	-6.389	-1.555	-.544	.223	-2.687	1.046
par_50	-.255	.625	-2.142	-1.001	-1.808	-1.572	2.586	4.973	5.541	2.617	6.716
par_51	-7.480	-5.396	-7.905	-8.069	-8.241	-9.043	-3.315	-2.945	-1.962	-5.256	-1.194

<Figure 3> Pairwise Parameter Comparisons Result by AMOS

considering affective factors. In the meanwhile, it is rational to assume that consumers' intention to continuously use the same service partially depends on them. When we focus on relatively more personal and informal services such as making friends, chatting, and shopping, the effect of affective factors and users' intrinsic characteristics will grow.

In this paper, we identified a couple of impressive findings while examining how intimacy and gender differences influence user satisfaction and, consequently, continuance use. First, perceived usefulness is selected as a representative cognitive factor and then compared with intimacy. The results show that even though perceived usefulness can still directly as well as indirectly explain continuance use through user satisfaction, intimacy is more tightly related to continuance use than perceived usefulness is. The effect of perceived usefulness may be greater than that of intimacy at the time of pre-adoption phase: intention to use an on-line shopping service. Observing how the strengths of perceived usefulness and intimacy change at the times of pre-adoption, post-adoption and long-term continuance use should be meaningful as further research issue. In light of this research interest, the contribution of this paper is that intimacy does matter more than perceived usefulness in explaining the cause of continuance use of on-line shopping services.

Second, intimacy seems to better explain continuance use directly than indirectly through satisfaction as perceived usefulness does. The beta value from intimacy to continuance intention ( $\beta = 0.51$ ) was much greater than the beta value from satisfaction to continuance intention ( $\beta = 0.26$ ). This implies that once an in-

timate relationship has been built between the users and on-line shopping services, the users tend to be loyal customers even when the on-line shopping service does not consistently satisfy the users' expectations. In fact, internet shopping mall markets all over the world are undergoing the trends of oligopoly, increasingly suppressing competition. Indeed, digital economists' switching cost concept rationalizes well this prevalent market dominance by few service providers; it claims that repetitive visitors feel psychological burdens at the thought of against changing their regular on-line shopping service providers.

Such relationship between intimacy and continuance intention also entails following implications: it provides a new interpretation of users' continuous using behavior shown in the context of an on-line shopping service as to what factors give rise to a tight relationship between the users and the service. A new affective factor, intimacy, which had been considered as an important factor to tighten human relationship in general was proposed in this paper as a factor to explain IT continuance intention and confirmed that it had a significant influence. Also results from this study raise a question on to what extent the satisfaction factor can boost continuance intention, which has been consistently emphasized in various study models including the ECM. Since this study shows that intimacy has greater effect than satisfaction on continuance intention, this can be interpreted that a user is likely to maintain his or her continuous use of a certain service as long as the user has established some intimacy with the relevant service despite some momentary dissatisfaction he or she may experience.

The results of our research on the relation-



ship between intimacy and continuance intention can provide useful insights in the field especially in establishing an effective marketing strategy to secure customers' loyalty. It can be suggested that further diverse methods can help create more intimacy with users' such as membership point rewards and coupon system, which are normally used for expansion of loyal customers in other industries.

Finally, we have observed gender effect while examining the intimacy-continuance bond. As expected based on the previous literature, women seem to be more sensitive to affective factors. Unlike previous research we find evidence in the context of on-line shopping services. So far, however, on-line shopping services do not generally differentiate their services according to their customers' gender. Even when some

providers are already aware of the gender effect, they merely consider gender as a property in a user profile, which is only useful to perform market segmentation for investigating whether certain services they provide are male- or female- specific services. Recently, though, the personalization technology based on awareness computing has been evolved and ready to be applied to estimate who the current users are. Using such valuable information, service providers can more effectively plan a sophisticated service in a dynamic and personalized manner specifically for the recent visitors as well as consumers on their web-sites. Therefore, it is deemed timely and appropriate for on-line shopping service providers to more actively adopt awareness computing in their line of business.

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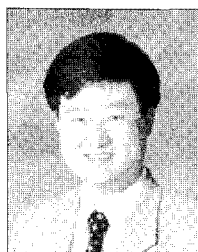
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