■ *Research Paper*

Flow Experience and Internet Shopping Behavior: Investigating the Moderating Effect of Consumer Characteristics

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Researchers have recognized that flow is a constructive construct for elucidating consumer behavior in the context of computer-mediated environments. Accordingly, this paper endeavours to investigate the relationship between flow experience and Internet shopping behavior to which the moderating role of consumer characteristics (trust propensity, willingness to buy and self-confidence) is concerned. Data collected from 395 customers of an online shopping store provide support for the proposed research model. The results show that flow experience is significantly and positively related to Internet shopping behavior (continuance intention, purchase intention and impulsive buying). In addition, it also suggests that the relationship between flow experience and Internet shopping behavior is moderated by consumer characteristics. Specifically, when the extent of a customer's trust propensity, willingness to buy or self-confidence is relatively high, the influence of flow experience on Internet shopping behaviors is maximized. According to the findings, the implications and future research suggestions are provided. Copyright © 2011 John Wiley & Sons, Ltd.

Keywords flow experience; internet shopping behaviors; consumer characteristics

INTRODUCTION

Flow has been described as a state of optimal psychological experience (Novak *et al.*, 2000),

resulting from engagement in a variety of activities, such as sports, writing, work, games, hobbies and website use. When in flow state, an individual becomes entirely focused on his or her activity and experiences many positive experiential characteristics, including great enjoyment and loss of self-consciousness (Jackson and Marsh, 1996). Accordingly, flow experience has

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been viewed as a crucial determinant of online customers' subjective enjoyment of website use (Csikszentmihalyi, 1993; Koufaris, 2002; Lu *et al.*, 2009; Siekpe, 2005; Wu and Chang, 2005). Researchers have also found that computer-mediated environments facilitate flow experiences because they require high concentration, involve the distortion of time and bring about increased levels of pleasure (Csikszentmihalyi, 1990; Hoffman and Novak, 1996). Hoffman and Novak (1996) extend the general applicability of flow to computer-mediated environments by suggesting that the success of online marketers depends on their ability to create opportunities for consumers to experience flow. If the use of the web can potentially serve as entry into flow state (i.e. an enjoyable experience), web users should ultimately improve their subjective well-being by accumulated ephemeral moments. Numerous researchers have investigated flow in various conditions, including human–computer interaction (Csikszentmihalyi, 1990; Ho and Kuo, 2010; Hsu and Lu, 2004; Trevino and Webster, 1992; Webster *et al.*, 1993) and web use (Chen *et al.*, 1999; Chen *et al.*, 2000; Pace, 2004), and the concept has been regarded as useful insight into consumer behavior (Chen *et al.*, 1999; Hoffman and Novak, 1997; Shin and Kim, 2008).

Moreover, as proposed by Smith and Sivakumar (2004), no two consumers are alike. Thus, to probe into purchase behavior on the Internet, consumer characteristics (e.g. trust propensity, willingness to buy and self-confidence) have been recommended as factors to consider in determining what influences consumers during online shopping (Smith and Sivakumar, 2004). Accordingly, along

with the investigation of the link between flow experience and Internet shopping behavior, this paper also seeks to verify the moderating role of consumer characteristics in the flow–Internet shopping behavior relationship.

RESEARCH MODEL AND HYPOTHESES

Hypotheses Development

Internet shopping behaviors are modelled as consequences of flow experience, whereas consumer characteristics are functioned as moderators between the flow experience and Internet shopping behavior. Figure 1 displays the research model. The related hypotheses are further detailed.

Flow Experience and Internet Shopping Behavior

Flow experience has been shown to increase learning and changes in attitudes and behaviors (Webster *et al.*, 1993). In an online context, researchers have theorized that such flow experience can attract consumers and significantly affect subsequent attitudes and behaviors (Novak *et al.*, 2000). Specifically, researchers have revealed that flow experience is a significant determinant of consumer attitudes toward the focal website and the focal firm (Mathwick and Rigdon, 2004), thus increasing the intention to revisit and spend additional time on the website (Kabadayi and Gupta, 2005). Numerous previous studies have also presented a strong
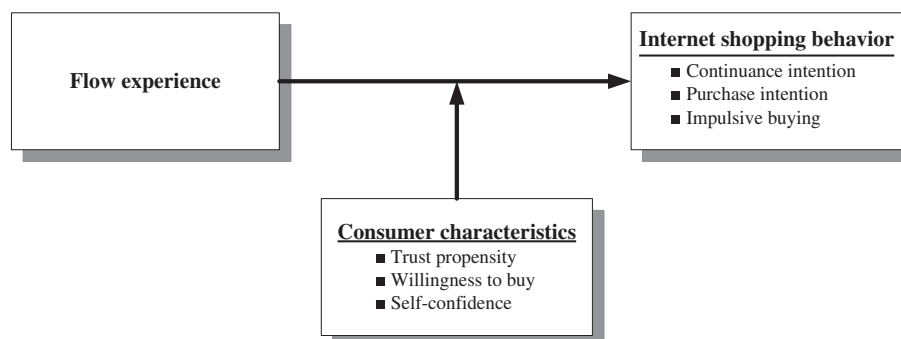

Figure 1 The research model

relationship between online flow experience and subsequent online behaviors (Chen *et al.*, 1999; Skadberg and Kimmel, 2004; O'Cass and Carlson, 2010). Celsi *et al.* (1993) found that people who experience flow have a tendency to replicate or re-experience that state. Cyr *et al.* (2005) suggested that customers who experience flow while shopping online would be likely to consider return visits to the website or purchasing from it in the future. Therefore, a consumer who experiences flow will attempt to reengage and revisit the activity that delivered the flow experience. Accordingly, the following hypothesis is constructed:

H1a: Flow experience will be positively related to continuance intention.

Furthermore, Nel *et al.* (1999) and Rettie (2001) indicated that flow experience appeared to prolong Internet and website use. Hsu and Lu (2004) demonstrated that flow experience is positively and significantly related to intention to play an online game. Korzaan (2003) found that that experiencing flow affects behavioral intention such as an increase in the likelihood of purchasing from a website. As confirmed by Wu and Chang (2005), the flow experience can increase the transaction intentions of members when they are in the online travel communities. Specifically, consumers who experience flow while shopping online would be likely to generate transaction intentions. Hence, the following hypothesis is constructed:

H1b: Flow experience will be positively related to purchase intention.

In addition, we also realize from flow research that intrinsic enjoyment can enhance a user's exploratory behavior (Ghani and Deshpande, 1994). Beatty and Ferrell (1998) found an increase in impulse purchasing urges for shoppers with positive feelings during shopping. Specifically, the significance of positive emotional responses is likely to facilitate consumers' impulsive purchases. Consumers' impulsive nature implies that they depend a lot on consumer feelings. Accordingly, in the context of online shopping, if online consumers enjoy their shopping experience, they may engage in more exploratory browsing in the web store,

leading to more impulsive buying (Koufaris, 2002). Moreover, we learn from flow theory that when flow experience occurs, an individual becomes entirely focused on their activity. As proposed by Koufaris (2002), consumers that are able to focus their attention at a web store should also be more likely to notice marketing promotions on the site. In other words, if consumers are not paying full attention to the contents of the website when buying online, they are less likely to notice products that they might otherwise buy on impulse. Consequently, the following hypothesis is constructed:

H1c: Flow experience will be positively related to impulsive buying.

Trust Propensity as a Moderator

Internet shopping involves trust not only between the consumer and the Internet merchant, but also between the consumer and the computer system through which transactions are performed. Trust in the online store has previously been verified as an essential antecedent to online buying and repeat buying behaviors (Gefen and Straub, 2004; Reichheld and Schefter, 2000). Thus, trust has a critical impact on consumer activities and thereby on e-commerce success (Corbitta *et al.*, 2003). In short, e-commerce success, particularly in the business-to-consumer area, is determined partly by whether consumers trust sellers and products they cannot see or touch and electronic systems with which they have no prior experience (Lee and Turban, 2001).

Yang *et al.* (2009) indicated that consumer characteristics such as individual trust propensity will influence the consumer trust in web shopping. Trust propensity is a personality trait that is defined as a 'general willingness based on extended socialization to depend on others' (McKnight and Chervany, 2001/2002; Ridings *et al.,* 2002). Trust propensity characterizes an individual's inclination to trust or distrust other individuals. Those who typically trust others, under conditions of uncertainty, believe that they will be treated reasonably and that over time

their good acts will be reciprocated in some way (Smith *et al.*, 1983). Trusting individuals are less suspicious and less concerned about monitoring the behavior of others (Van Dyne *et al.*, 2000). McKnight *et al*. (1998) suggested that high trust propensity individuals believe 'that things turn out best when one is willing to depend on others, even though others may or may not be trustworthy'. Trust propensity intensifies or reduces the signals provided by cues (e.g. trustworthiness attributes) (Lee and Turban, 2001). Individuals vary in their readiness to trust others (people or other entities), and this individual characteristic has been shown to have an effect on customer trust in online shopping as well (Lee and Turban, 2001). Cheung and Lee (2001) indicated that trust propensity will affect trust in Internet shopping. Limerick and Cunnington (1993) also believed that trust can reduce uncertainty concerning the future and is a necessity for a continuing relationship with participants who have opportunistic behavior. Thus, the formation of trust, in turn, reduces consumers' perceived risk of Internet shopping. In summary, consumers' general trusting disposition will play a key role in determining their Internet shopping behavior.

In addition, because consumers incline to use their prior experience as decision-making heuristics, consumers purchasing on the Internet can also be predicted to use their previous experience to formulate strategies for repurchasing behavior. Furthermore, consumers often need a lot of time and a pleasurable environment to foster ongoing search for products. Through a flow experience, consumers' behavioral intention will be improved by the positive feelings related to a flow experience state. Also, the flow experience can ensure that consumers give their attention for longer periods, consequently, facilitating more possibility of continuance intention. Consequently, the following hypothesis is constructed:

H2a: The greater the trust propensity, the stronger the relationship between flow experience and continuance intention.

Furthermore, as shown in the study of McCole *et al*. (2010), trust in the vendor and Internet has a positive influence on attitude towards online purchasing. That is, individuals with a high level of trust propensity will selectively attend to information congruent with their level of trust in humanity, as well as interpret new information based on their natural tendency (Limerick and Cunnington, 1993). Ferrin and Dirks (2003) provided a similar explanation and suggested that perhaps people with a low propensity to trust are more likely to have a 'suspicion' bias when processing information concerning one's trustworthiness. So, trust in the vendor and Internet enables the consumers to concentrate and focus on the undertaking. Besides, in the online context, when flow experience occurs, an individual becomes entirely focused on their activity and is likely to feel joyful and pleasant, which has been found to facilitate a more positive experience (Hoffman and Novak, 1996). Wu and Chang (2005) verified that flow experience is positively related to transaction intentions in the study of online tourism. Therefore, this moderation effect can be viewed positively in the sense that the greater the trust propensity, the stronger the impact of flow experience on purchase intention. Accordingly, the following hypothesis is constructed:

H2b: The greater the trust propensity, the stronger the relationship between flow experience and purchase intention.

In addition, the flow experience would improve consumers' satisfaction while facilitating feelings of pleasure and control, and also enable consumers to reduce the amount of time spent on deliberation to purchase online, as consumers will probably need less time to decide because of their trust propensity with the web store (Smith and Sivakumar, 2004). Therefore, the flow experience allows consumers to make their purchasing decision in an expedient fashion. Accordingly, the following hypothesis is constructed:

H2c: The greater the trust propensity, the stronger the relationship between flow experience and impulsive buying.

Willingness to Buy as a Moderator

In traditional transactions, consumers typically have to expend physical energy and time to move to a retail site; however, the Internet

tenders consumers' immediate access. Because consumers have less at stake when determining to explore different Internet sites, they may be more likely to undertake browsing and/or information collecting without having actual purchase intentions. The Internet provides consumers with the unparalleled opportunity to shop purely for obtaining pleasure. Thus, true purchasing intentions may be lower for Internet shoppers than traditional brick-and-mortar retailers. This may be the reason that consumer characteristics, such as willingness to buy, need to be examined in terms of the formulation of consumers' decision-making regarding specific shopping behaviors (Smith and Sivakumar, 2004).

Baker *et al*. (1992) indicated that individuals are more likely to shop at a particular site and buy gifts for others when willingness to buy is high. Hoffman and Novak (1996) showed that flow experience facilitates exploratory behavior, which in turn increases the amount of time spent on the particular site. Specifically, flow experience presents itself as a mechanism by which low purchasing intention can be transformed into site/store loyalty during shopping activities (Smith and Sivakumar, 2004). As shown by Rice (1997), whether or not consumers will return to an Internet site depends on the factors of content, enjoyment, layout and uniqueness. Thus, influencing a consumer to return to a particular site is based on their previous interaction with the site (Smith and Sivakumar, 2004). Therefore, when willingness to buy is high, continuance and purchase intention will be facilitated by flow experience. Consequently, the following hypotheses are constructed:

H3a: The greater the willingness to buy, the stronger the relationship between flow experience and continuance intention.

H3b: The greater the willingness to buy, the stronger the relationship between flow experience and purchase intention.

Furthermore, pleasure and arousal derived from a store are positively related to willingness to buy and the amount of time spent in the store environment (Donovan and Rossiter, 1982). That is, with a high degree of willingness to purchase,

consumers will approach the shopping experience with strong shopping motivations (Smith and Sivakumar, 2004). Thus, flow experience, which results in feelings of pleasure and control, moves customers to the act of purchasing in an expedient manner while reducing the amount of deliberation time necessary before purchase. Consequently, the following hypothesis is constructed:

H3c: The greater the willingness to buy, the stronger the relationship between flow experience and impulsive buying.

Self-confidence as a Moderator

Confidence, recognized as an important consumer characteristic in this study, is originated with consumers' attitudes and directly affects their purchasing intentions (Howard, 1977). Through repeat purchases, the individual can affirm his or her self-identity through the performance of specific shopping behavior (Sparks and Shepherd, 1992). The more an individual purchases from a particular site, the more helpful his or her self-perception may be (Smith and Sivakumar, 2004). As individuals with a higher level of self-confidence shift from novices to more experienced consumers on a particular site, they will feel more assured about past purchasing decisions, which will make them more likely to return to a particular store or site (Smith and Sivakumar, 2004). Furthermore, when flow experience occurs, people are likely to feel enjoyable (Hoffman and Novak, 1996) and they have a tendency to replicate or re-experience that state (Celsi *et al.*, 1993). Thus, the following hypothesis is constructed:

H4a: The greater the self-confidence, the stronger the relationship between flow experience and continuance intention.

Individuals with a high level of self-confidence will feel very driven and confident in their search for product details (Sirgy, 1982). Highly self-confident individuals may feel that their skills allow them to meet or supersede the difficulty of the tasks at hand. In addition, when in flow state, individuals will prolong the engagement in exploratory behaviors during the online shopping process (Hoffman and Novak, 1996). Chou

and Ting (2003) also proposed that while flow experience occurs, a consumer experiences a sense of happiness, accompanied by a feeling of confidence and an exploratory desire. In addition, in an online shopping context, researchers found that flow experience can attract consumers and significantly influence subsequent behavioral intention (Novak *et al.*, 2000). Consequently, the following hypothesis is constructed:

H4b: The greater the self-confidence, the stronger the relationship between flow experience and purchase intention.

When in flow state, an individual becomes entirely focused on their activity and experiences many positive experiential characteristics including great enjoyment and loss of self-consciousness (Jackson and Marsh, 1996). When consumers experience flow, they are likely to obtain the increased pleasure that has been found to facilitate positive affect or mood (Hoffman and Novak, 1996). Researchers have found that individuals who are in a good mood will be more likely to engage in purchasing behavior (Bloch *et al.*, 1986). Individuals with a high degree of confidence perceive that their own abilities and skills will help them manage the risks typically associated with Internet shopping; thus, decreasing the amount of time they need to make a purchase decision (Smith and Sivakumar, 2004). Therefore, a consumer with a higher level of self-confidence may be more likely to engage in impulsive buying because of the positive affect created by flow experience, as well as the individual's perceptions regarding his or her ability to manage the risks associated with Internet shopping. Consequently, the following hypothesis is constructed:

H4c: The greater the self-confidence, the stronger the relationship between flow experience and impulsive buying.

METHODOLOGY

Participant Data Collection

The web store selected for this study was Yahoo Shopping Center (http://buy.yahoo.com.tw/) because it is the first choice for online customers

in Taiwan according to the industry reports of Market Intelligence Center. This study selected respondents who were consumers of the site in order to examine the relationships hypothesized in this study. Following this, all respondents were asked to indicate the extent to which they agreed with the statements in the questionnaire. Before distributing the survey questionnaire, the respondents were queried about whether they used the site to shop. If the respondents answered affirmatively, the interviewer provided them with the survey questionnaire. If not, the respondents were not offered the survey questionnaire. All survey questionnaires were distributed to respondents in person via the interviewer between March 1 and April 30 of 2010 (about 2 months). Respondents who participated in this study were considered a convenience sample. Before the start of the study, three postgraduate students were trained as interviewers to fully understand the content of the questionnaire in order to answer questions from respondents. Respondents who participated in the study and completed the questionnaire were provided a small gift (a ballpoint pen) as a token of gratitude. A total of 412 responses were received. After eliminating incomplete and inappropriate responses (e.g. duplicates), a total of 395 usable responses were included in the sample for analysis (a net response rate of 95.9%).

As noted in Table 1, among the 395 usable responses, the majority were females (53.9%) and unmarried (75.4%) individuals. Respondents from 18 to 29 years old (43.8%) and 30 to 39 years old (37.2%) account for the largest portion of the sample, followed by individuals 40 to 49 years old (16.5%). More than 95% of the respondents indicated education level at college and above. In addition, 46.6 % of the respondents were students and 20.5% were from the public servants. This study used the extrapolation technique, equating late responses to nonrespondents in order to test the nonresponse bias (Armstrong and Overton, 1977). Responses were separated into two groups, specifically, those received before the second distribution and those received after the second distribution. A *t*-test of difference was conducted on demographic variables, including gender, marital status, age, education level and occupation. No statistically significant

Table 1 Demographic characteristics

Variables		Frequency (s)	Percentage of total (%)
Gender	Male	182	46.1
	Female	213	53.9
Marital status	Married	97	24.6
	Unmarried	298	75.4
Age	18–29	173	43.8
	30–39	147	37.2
	40–49	65	16.5
	50 and over	10	2.5
Education level	High school or below	11	2.8
	College	275	69.6
	Graduate school or above	109	27.6
Occupation	Student	184	46.6
	Public servant	81	20.5
	Industrial	15	3.8
	Commercial	62	15.7
	Professionals	22	5.6
	Miscellaneous (e.g. retired, housekeeper)	31	7.8

differences were identified at $p < 0.05$, leading the researchers to conclude that respondents are not different from nonrespondents. Similarly, using the extrapolation method, no significant differences in either mean scores or variances were found for any key constructs between early (i.e. before second distribution) and late (i.e. after second distribution) respondents, indicating that nonresponse bias is a relatively minor concern.

Measurement

As shown in the Appendix, the measurement scales used to operationalize the research constructs involved in this study were adapted from the existing literature, and others were developed based on the extant conceptual studies. Control, attention focus, curiosity and intrinsic interest are used to measure flow experience by using three items from Huang (2003). Among the three measures of Internet shopping behavior, continuance intention is measured using three items from Liao *et al.* (2006). Purchasing intention is measured using four items from Maxham (2001).

Four items are adapted from Sim and Koi (2002) to measure impulsive buying. Four items are adapted from Lee and Turban (2001) to measure trust propensity. Willingness to buy is measured using four items from Jarvenpaa *et al.* (2000). Four items are adapted from Dash *et al.* (1976) to measure self-confidence. All items are measured on five-point scales ranging from '1=strongly disagree' to '5=strongly agree'.

DATA ANALYSIS AND RESULTS

This study used LISREL 8.54 (Scientific Software International, Chicago, IL, USA) to test the relationship between flow experience and Internet shopping behavior. In addition, this study used SPSS 12.0 (SPSS Inc., Chicago, IL, USA) to substantiate the moderating role of consumer characteristics and to analyse descriptive statistics, reliability and validity.

Reliability and Validity Analysis

To evaluate the convergent validity of the measurements, this study used three measures proposed by Fornell and Larcker (1981), including the item reliability of each measure, the composite (construct) reliability of each construct and the average variance extracted (AVE) for each construct (Table 2). The item reliability of a measure is evaluated by using its factor loading of the underlying construct (Shih, 2004). The results revealed that the factor loadings of all the measures' underlying constructs exceed 0.5 and thus confirm the test of item reliability (Hair *et al.*, 1995). Furthermore, construct reliability is evaluated by using Cronbach's α. The results showed that the reliabilities of all constructs were between 0.761 and 0.907 and thus confirm the test of construct reliability (Nunnally, 1978). In addition, noted in Table 2, this study found that the AVE from each construct exceeds 0.5 and thus demonstrated convergent validity (Fornell and Larcker, 1981). Overall, the convergent validity test indicated that the proposed constructs of the extended model was adequate.

Furthermore, if the items in a construct correlate more highly with each other than with items measuring other constructs, the measure is regarded as

Table 2 Reliability and factor loadings

Variables	Factor Loading	Reliability[a]	Average variance extracted
Control		0.876	0.713
Control 1	0.894		
Control 2	0.720		
Control 3	0.906		
Attention focus		0.826	0.625
Attention focus 1	0.774		
Attention focus 2	0.857		
Attention focus 3	0.735		
Curiosity		0.839	0.672
Curiosity 1	0.734		
Curiosity 2	0.866		
Curiosity 3	0.853		
Intrinsic interest		0.810	0.616
Intrinsic interest 1	0.800		
Intrinsic interest 2	0.807		
Intrinsic interest 3	0.747		
Continuance intention		0.761	0.543
Continuance intention 1	0.714		
Continuance intention 2	0.761		
Continuance intention 3	0.734		
Purchase intention		0.838	0.540
Purchase intention 1	0.740		
Purchase intention 2	0.707		
Purchase intention 3	0.779		
Purchase intention 4	0.712		
Impulsive buying		0.823	0.542
Impulsive buying 1	0.711		
Impulsive buying 2	0.772		
Impulsive buying 3	0.726		
Impulsive buying 4	0.734		
Trust propensity		0.907	0.755
Trust propensity 1	0.801		
Trust propensity 2	0.838		
Trust propensity 3	0.915		
Trust propensity 4	0.917		
Willingness to buy		0.904	0.592
Willingness to buy 1	0.742		
Willingness to buy 2	0.736		
Willingness to buy 3	0.783		
Willingness to buy 4	0.815		
Self-confidence		0.862	0.602
Self-confidence 1	0.844		
Self-confidence 2	0.796		
Self-confidence 3	0.786		
Self-confidence 4	0.667		

[a]Reliability is estimated using Cronbach's α coefficients.

having adequate discriminant validity (Cho, 2006). Table 3 shows the squared intercorrelations among the variables, suggesting that the shared variance among the variables does not surpass the average variance explained (Cho, 2006). Hence, discriminant validity is justified in this study.

Structural Model

Using structural equation modelling, the hypothesized relationships between flow experience and Internet shopping behavior were tested and analysed. As seen in Figure 2, the overall results suggested that the research model offers an adequate fit to the data.

The Relationship between Flow Experience and Internet Shopping Behavior

As seen in Figure 3, the results supported the relationship between flow experience and Internet shopping behavior. H1a is supported; namely, flow experience positively and significantly influenced the continuance intention ($\beta = 0.78$, $p < 0.001$). Moreover, flow experience was also found to be positively related to the purchase intention ($\beta = 0.56$, $p < 0.001$) and impulsive buying ($\beta = 0.67$, $p < 0.001$). Therefore, H1b and H1c were also supported. Based on the displayed results, the researchers postulate that the stronger the consumers experienced flow, the stronger the consumers' continuance, purchase intention and impulsive buying on the website are.

The Moderating Effect of Trust Propensity, Willingness to Buy and Self-confidence

As consistent with the way of Hsu *et al.* (2010), this study used partial correlation analysis to investigate whether consumer characteristics (i.e. trust propensity, willingness to buy and self-confidence) positively moderate the link between flow experience and Internet shopping behavior. First, in order to confirm the moderating effect of trust propensity, this study investigated whether trust propensity positively moderates the link

Table 3 Squared intercorrelation among the study constructs

	Dimension	1	2	3	4	5	6	7	8	9	10
1	Control	0.713									
2	Attention focus	0.068	0.625								
3	Curiosity	0.068	0.078	0.672							
4	Intrinsic interest	0.083	0.053	0.139	0.616						
5	Continuance intention	0.199	0.112	0.100	0.229	0.543					
6	Purchase intention	0.065	0.037	0.070	0.163	0.124	0.540				
7	Impulsive buying	0.163	0.092	0.139	0.138	0.176	0.114	0.542			
8	Trust propensity	0.005	0.005	0.003	0.013	0.024	0.057	0.021	0.755		
9	Willingness to buy	0.092	0.366	0.153	0.052	0.125	0.040	0.150	0.010	0.592	
10	Self-confidence	0.043	0.039	0.021	0.079	0.085	0.346	0.067	0.078	0.038	0.602

All correlations are significant at the 0.05 level. The diagonals represent the average variance extracted.
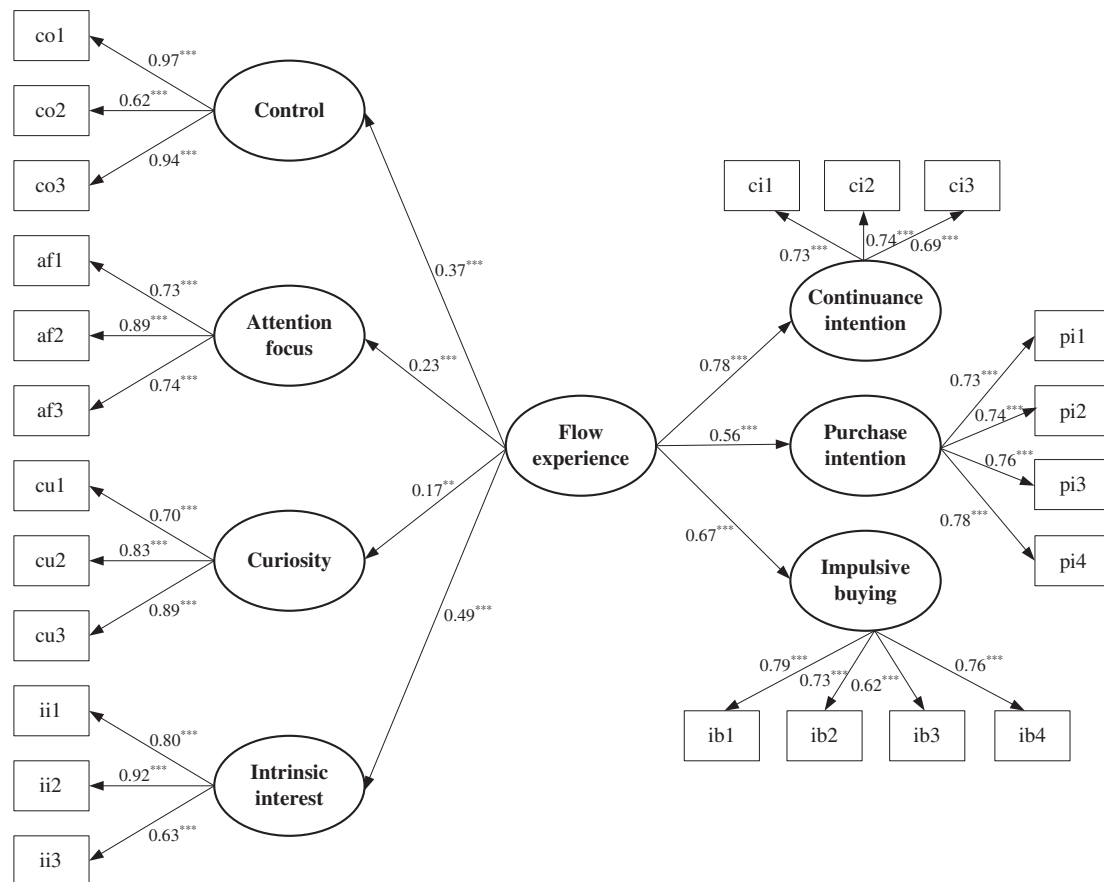
Notes: ***(p<0.001); **(p<0.01);*(p<0.05).
χ^2: 461.27; df: 217; GFI: 0.91; AGFI: 0.88; CFI: 0.97; NFI: 0.95; NNFI: 0.97; IFI: 0.97; RMSEA: 0.053.

Figure 2 Results of structural modelling analysis

between flow experience and Internet shopping behavior. The results indicated that if the moderating role of trust propensity is not eliminated, the

correlation coefficient of flow experience and continuance intention was 0.583 ($p < 0.001$), but if the moderating role of trust propensity was
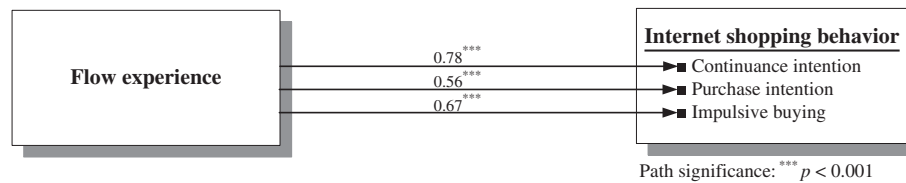
Figure 3 Hypotheses testing results

eliminated, the partial correlation coefficient of flow experience and continuance intention was 0.576 ($p < 0.001$). This result clearly showed that trust propensity moderates the link between flow experience and continuance intention. Furthermore, if the moderating role of trust propensity was not eliminated, the correlation coefficient of flow experience and purchase intention was 0.407 ($p < 0.001$), but if the moderating role of trust propensity was eliminated, the partial correlation coefficient of flow experience and purchase intention was 0.394 ($p < 0.001$). This result clearly demonstrated that trust propensity moderates the link between flow experience and purchase intention. In addition, if the moderating role of trust propensity was not eliminated, the correlation coefficient of flow experience and impulsive buying was 0.535 ($p < 0.001$), but if the moderating role of trust propensity was eliminated, the partial correlation coefficient of flow experience and impulsive buying was 0.527 ($p < 0.001$). This result clearly showed that trust propensity moderates the link between flow experience and impulsive buying.

Furthermore, the moderating effect of willingness to buy was also confirmed in this study. Specifically, this study found that willingness to buy moderates the links between flow experience and continuance intention, between flow experience and purchase intention, as well as between flow experience and impulsive buying. Finally, self-confidence also demonstrated that it will moderate the links between flow experience and continuance intention, between flow experience and purchase intention, as well as between flow experience and impulsive buying. To summarize, the foregoing results can be seen in Table 4.

In addition, to test how the different levels of trust propensity influence the links between flow experience and Internet shopping behaviors, the

data on trust propensity and flow experience were divided into high and low groups based on their mean scores ($M = 3.539$ for trust propensity, $M = 3.568$ for flow experience). The first group displays high trust propensity and high flow experience ($n = 188$); the second group displays high trust propensity but low flow experience ($n = 40$); the third group displays low trust propensity but high flow experience ($n = 37$); and, finally, the fourth group displays low trust propensity and low flow experience ($n = 130$).

As consistent with the way of Chang *et al*. (2010), this study used the ANOVA analysis and Duncan post hoc test to achieve the mentioned purposes. Results found that the *F*-values and *p*-values are all significant ($F = 41.356$, $p < 0.001$). According to the results of the Duncan post hoc test, the Internet shopping behaviors of the first group are higher than that of the other three groups, whereas there is no significant difference between the Internet shopping behavior levels of the second and the third group. Furthermore, when trust propensity is low, high flow experience will entail lower Internet shopping behaviors than does low flow experience coupled with a high level of trust propensity. Thus, a customer's trust propensity has a significant impact on the links between flow experience and Internet shopping behaviors. Thus, H2a, H2b and H2c are supported.

Similarly, to test how the different levels of willingness to buy influence the links between flow experience and Internet shopping behaviors, the data on willingness to buy and flow experience were also divided into high and low groups based on their mean scores ($M = 3.551$ for willingness to buy, $M = 3.568$ for flow experience). The first group displays high willingness to buy and high flow experience ($n = 196$); the second group displays high willingness to buy but low

Table 4 The moderating effect of consumer characteristics

| | Partial correlation coefficient | | | | | |
| | Trust propensity | | Willingness to buy | | Self-confidence | |
	Not eliminated	Eliminated	Not eliminated	Eliminated	Not eliminated	Eliminated
Flow experience and continuance intention	0.583***	0.576***	0.407***	0.394***	0.535***	0.527***
Flow experience and purchase intention	0.583***	0.497***	0.407***	0.364***	0.535***	0.415***
Flow experience and impulsive buying	0.583***	0.542***	0.407***	0.294***	0.535***	0.495***

***$p < 0.001$.

flow experience ($n=42$); the third group displays low willingness to buy but high flow experience ($n=38$); and, finally, the fourth group displays low willingness to buy and low flow experience ($n=119$).

Again, using the ANOVA analysis and Duncan post hoc test, results show that the F-values and p-values are all significant ($F=37.214$, $p<0.001$). According to the results of the Duncan post hoc test, the Internet shopping behaviors of the first group are higher than that of the other three groups, whereas there is no significant difference between the Internet shopping behavior levels of the second and the third group. Furthermore, when willingness to buy is low, high flow experience will entail lower Internet shopping behaviors than does low flow experience coupled with a high level of willingness to buy. Thus, a customer's willingness to buy has a significant impact on the links between flow experience and Internet shopping behaviors. Thus, H3a, H3b and H3c are supported.

Finally, to test how the different levels of self-confidence influence the links between flow experience and Internet shopping behaviors, the data on self-confidence and flow experience were also divided into high and low groups based on their mean scores ($M=3.547$ for self-confidence, $M=3.568$ for flow experience). The first group displays high self-confidence and high flow experience ($n=190$); the second group displays high self-confidence but low flow experience ($n=39$); the third group displays low self-confidence but high flow experience ($n=42$); and, finally, the fourth group displays low self-confidence and low flow experience ($n=124$).

Similarly, using the ANOVA analysis and Duncan post hoc test, results found that the F-values and p-values are all significant ($F=43.514$, $p<0.001$). According to the results of the Duncan post hoc test, the Internet shopping behaviors of the first group are higher than that of the other three groups, whereas there is no significant difference between the Internet shopping behavior levels of the second and the third group. Furthermore, when self-confidence is low, high flow experience will entail lower Internet shopping behaviors than does low flow experience coupled with a high level of self-confidence. Thus, a customer's self-confidence has a significant impact on the links between flow experience and Internet shopping behaviors. Thus, H4a, H4b and H4c are supported.

DISCUSSION

Based on the analysis of the pooled data, all of the hypotheses were supported. Specifically, the study demonstrated that flow experience is salient in influencing Internet shopping behavior. The findings imply that when a website fosters the flow experience among its customers, their continuance intention, purchase intention and impulse buying are the results. To ensure the desired shopping behavior, e-stores should seek to manage the shoppers' flow states on an individual basis (Smith and Sivakumar, 2004). In view of this, e-stores should be mindful in how the content, organization and layout of their

e-sites can be configured to promote the flow experience.

This study importantly demonstrated that the relationship between flow experience and Internet shopping behavior is moderated by consumer characteristics (i.e. trust propensity, willingness to buy and self-confidence). Specifically, when the extent of a customer's trust propensity, willingness to buy or self-confidence is relatively high, the influence of flow experience on his or her Internet shopping behavior is maximized. Thus, to contribute to the higher level of trust propensity by customers, e-stores can show their competence and concern by increasing communication with their customers and by using web security technologies to make sure that the customers are conscious of the precautions the company takes to ensure that transactions are secure (Koufaris and Hampton-Sosa, 2004). Then, to enhance customers' willingness to buy, e-stores can use virtual advisors and digital receipts to make the online experience feel as offline as possible (Freeman, 2000). To strengthen customers' self-confidence, e-stores should be able to provide information that is accurate, complete, timely and easy to understand (Shih 2004).

Implications

Our findings have several important implications for theory and practice relating to e-store practitioners and online marketing in general. First, albeit prior studies have confirmed the impact of flow experience on behavioral intention (Hsu and Lu, 2004; Qi et al., 2009; O'Cass and Carlson, 2010), the findings reported here specifically confirm the prominent role of flow on intention in relation to continuance and purchase and impulsive buying. Thus, if e-store practitioners are trying to create compelling online experiences for consumers to engender online shopping behavior, managers have to pay close attention to how they design or 'engineer' controllable elements of the website for consumers to facilitate flow. That is, focus needs to be placed on improving attributes of the website (such as content, navigation, responsiveness, e-commerce capabilities and supplementary service offers), which are considered

important by consumers to induce flow. Thus, collecting such insights from the customer provides information that assists managers in their allocation of resources and deployment of marketing capabilities over electronic networks to deliver flow experiences for consumers that facilitate favourable consumer behavior outcomes.

Second, although some researchers have assumed that flow represents an optimal state across consumption behaviors (Koufaris, 2002; Kabadayi and Gupta, 2005; Qi et al., 2009), our research further demonstrated that the relationship between flow experience and Internet shopping behavior is moderated by consumer characteristics. Thus, to ensure the desired shopping behavior, e-stores should attempt to manage the shoppers' flow states on an individual basis. Specifically, e-stores should invest in tools that enable them to develop personal profiles of their customers, while garnering information regarding the consumers' skills and their perceptions of the challenges presented by shopping in the site. In addition, e-stores must determine how the content, organization and layout of their e-sites can be configured to foster the flow that is necessary to manage consumers' willingness to buy. In addition to analysing data obtained after consumers have made a purchase, e-stores must also derive information about customer expertise, level of confidence and trust propensity at the beginning of the shopping experience. In this manner, e-stores will ensure that consumers are given appropriate cues based on their individual needs.

Third, previous studies in consumer behavior have examined shopping motivation from many different perspectives; however, no study has examined the link between flow experience and Internet shopping behaviors (Smith and Sivakumar, 2004). This study showed that there is a link between flow and Internet shopping behavior, and the link is moderated by consumer characteristics. Specifically, from an empirical perspective, this study extends the extant literature by testing and validating a model incorporating flow and online shopping behavior, and the link is moderating by consumer characteristics in the Internet environment using data from actual consumers in an online shopping context.

The findings also explained that the success of e-stores depends on their ability to create opportunities for consumers to experience flow and must consider the individual internal factors that influence consumers during Internet shopping.

Limitations and Directions for Future Research

The limitations of this research, addressed as follows, also provide the direction for future study. First, although the results successfully verified that flow experience impacts Internet shopping behavior, it is important to realize that other factors may also play a critical role in the antecedents of Internet shopping behavior. For instance, other factors include perceived usefulness (Ha and Stoel, 2009), perceived benefit (Lee, 2009), satisfaction (Chen and Cheng, 2009), attitude toward the website (Castaneda *et al.* 2009) and so on. Thus, future research should continue the search for antecedents that influence Internet shopping behavior. Second, the present research contributes to online consumer behavior literature by identifying the moderating role of consumer characteristics in the relationship between flow experience and Internet shopping behavior. Specifically, this study sheds new light on the role of consumer characteristics in relation to flow experience and Internet shopping behavior. However, the model included only a subset of the variables that can potentially influence the link between flow experience and shopping behavior. Thus, a future study could investigate the relationship between the flow experience and other individual differences—for example, the shopper's individualist or collectivist orientation— and the role of flow in special occasions involving gift giving (Smith and Sivakumar, 2004). Third, although convenience sampling is a way of having subjects that are selected because of their convenient accessibility and proximity to the researcher, it did not consider selecting subjects that are representative of the entire population. Thus, future research should use probability sampling method to recruit the respondents. If random selection was done accurately, the sample will be representative of the entire population. Fourth, in addition to the demographic characteristics included, some of the essential characteristics of the samples, such as the amount of spending in online shopping and the number of years of experience in online shopping, are not investigated. Thus, future research should investigate and include them in the demographic characteristics to avoid skewing the results. Finally, although this study was administered with a cross-sectional research approach, a longitudinal approach should also be taken into account for future research.

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APPENDIX: SCALE ITEMS

Scale	Items
Control (adapted from Huang 2003)	Control 1. When navigating this website, I felt in control. Control 2. I felt that I had no control over my interaction with the web. Control 3. This website allowed me to control the computer interaction.
Attention focus (adapted from Huang 2003)	Attention focus 1. When navigating this website, I thought about other things. Attention focus 2. When navigating this website, I was aware of distractions. Attention focus 3. When navigating this website, I was totally absorbed in what I was doing.
Curiosity (adapted from Huang 2003)	Curiosity 1. Navigating this website excited my curiosity. Curiosity 2. Interacting with this website made me curious. Curiosity 3. Navigating this website aroused my imagination.
Intrinsic interest (adapted from Huang 2003)	Intrinsic interest 1. Navigating this website bored me. Intrinsic interest 2. Navigating this website was intrinsically interesting. Intrinsic interest 3. This website was fun for me to use.
Continuance Intentions (adapted from Liao *et al.* 2006)	Continuance intentions 1. I intend to continue using the website rather than discontinue its use. Continuance intentions 2. My intentions are to continue using the website rather than any alternative means. Continuance intentions 3. If I could, I would like to continue use of the website.
Purchase intention (adapted from Maxham, 2001)	Purchase intent 1. The next time I desire an online shopping, I intend to use the website. Purchase intent 2. I will continue using the website for my online shopping. Purchase intent 3. The next time you are in the market for online shopping, how likely are you to purchase from the website? Purchase intent 4. The next time I make a purchase, I will not use the website as my online provider.
Impulsive buying (adapted from Sim and Koi 2002)	Impulsive buying 1. I often buy things that I never intended to buy. Impulsive buying 2. I think I am an impulsive buyer. Impulsive buying 3. I often go shopping without any specific need. Impulsive buying 4. I often feel guilty for buying so many unnecessary things.
Trust propensity (adapted from Lee and Turban 2001)	Trust propensity 1. It is easy for me to trust a person/thing. Trust propensity 2. My tendency to trust a person/thing is high. Trust propensity 3. I tend to trust a person/thing, even though I have little knowledge of it. Trust propensity 4. Trusting someone or something is not difficult.
Willingness to Buy (adapted from Jarvenpaa *et al.* 2000)	Willingness to buy 1. How likely is it that you would return to the website? Willingness to buy 2. How likely is that you would consider purchasing from the website in the next 3 months? Willingness to buy 3. How likely is it that you would consider purchasing from the website in the next year? Willingness to buy 4. For this purchase, how likely is it that you buy from the website?
Self-confidence (adapted from Dash *et al.* 1976)	Self-confidence 1. Do you ever feel bothered about what other people think of you? Self-confidence 2. How do you feel about your abilities in general? Self-confidence 3. Just before your recent purchase of some product, how would you have rated your ability to judge the quality of product? Self-confidence 4. Just before your recent purchase of some product, how confident were you in your ability to make a good choice when you recently purchased some product?