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Extrinsic versus intrinsic motivations for consumers to shop on-line

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Abstract

Previous research has usually assumed that shopping on-line is a goal-oriented activity and is motivated by extrinsic factors of the customers. On the other hand, intrinsic factors, such as entertainment, have been found to be a major reason for peoples to use the Internet. This study examined whether such intrinsic motivations can be used to explain consumers' acceptance of on-line shopping. A theoretical model, based on the technology acceptance model, was proposed to describe the intrinsic and extrinsic motivations of consumers to shop on-line. Results of this empirical study showed that perceived usefulness is not an antecedent of on-line shopping, while fashion and a cognitive absorption experiences on the web were more important than their extrinsic factors in explaining on-line consuming behavior. Implications and limitations were discussed.

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Keywords: B2C; e-Commerce; Technology acceptance model; Flow theory

1. Introduction

The Internet has become an important channel for companies to provide product information and offer direct sales to their customers. Firms of all sizes and from all industries have invested in Internet applications and try to establish a net presence. However, on-line sales volumes remain relatively low compared to traditional retailing. People increasingly use the Internet to check out company or product information but do not normally use it for direct purchasing of products [32]. Understanding consumer's incentives to shop on-line is critical in the development of the e-tailing part of the industry. However, empirical

evidence of the impact of the World Wide Web on consumer shopping behavior has still been inconclusive [27].

Studies of adoption of IS have often used the Technology Acceptance Model (TAM) to predict and explain end-user behavior and system use. It assumes that perceived usefulness and perceived ease of use are the primary determinants of system use. Although results of many empirical studies have suggested that TAM yields highly consistent results in the acceptance of new systems by users, past research has also suggested the need for incorporating additional factors or integrating TAM with other theories in order to improve its specificity and explanatory power [22,33].

On-line shopping can be perceived as the consumers' adoption of the WWW as a means to purchase. Therefore, based on the TAM, consumers' use of a

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virtual store could be explained by the perceived usefulness and perceived ease of use of on-line shopping. The advantages for customers are supposed to be clear and include convenience, a broader selection of products, competitive pricing, greater access to information, and lower search cost [3]. Also, it is assumed that the marketplace will become frictionless, and the increased efficiency would be likely to provide social gain for both consumers and producers [4]. However, empirical evidence has been mixed and the benefits still need to be investigated [7,31,43].

These motivations are all extrinsic. The intrinsic motivations include perceived enjoyment and these generally have been neglected in on-line shopping. Lack of entertainment and social interaction are believed to be one disadvantage of B2C e-commerce [34]. But motivations like perceived playfulness and social influence are often used to explain users' voluntarily acceptance of new IT [13]. However, while shopping on-line is usually assumed to be less fun than brick-and-mortar shopping, entertainment has also been a flourishing segment in the WWW. Although shopping on-line cannot provide the same kind of fun as traditional shopping, it is still necessary to investigate whether factors such as perceived playfulness and social influence are major motivations that drive users to shop on-line.

2. Theoretical background

2.1. Technology acceptance model

Based on Fishbein and Ajzen's Theory of Reasoned Action (TRA), TAM assumes that the beliefs about the computer system influence attitudes, which in turn lead to intention, and then generate behavior to use a system. Both TRA and TAM assert that the influence of external variables upon user behavior is mediated through user beliefs and attitudes. Beliefs relate to an individual's

subjective assessment that performing some behavior will result in a specific consequence, whereas attitudes relate to an individual's positive or negative affective feelings about performing the behavior [23].

TAM is different from generic TRA; it replaces attitudinal determinants, derived separately for each behavior, with two variables about beliefs, perceived usefulness and perceived ease of use [25]. Perceived usefulness means "the prospective user's subjective probability that using a specific application system will increase his or her job performance within an organizational context," and perceived ease of use is "the degree to which the prospective user expects the target system to be free of effort" [12]. Perceived ease of use is also assumed to influence perceived usefulness. The original TAM is presented in Fig. 1.

TAM has been extended and tested with different external variables and in various applications. The applications have recently been extended to the Internet arena [35]. Numerous empirical studies have found that TAM consistently explains a substantial proportion of the variance in usage intentions and behavior. However, Deci's [14] distinction between extrinsic and intrinsic motivators suggests that individuals may be motivated to use the applications because of intrinsic rewards, the perceived benefits, and external pressures, but only perceived usefulness, an extrinsic motivator, is mentioned in TAM.

2.2. Intrinsic motivations

This is related to the need for self-determination, the need for competence, and interest–excitement and flow. When people are intrinsically motivated, they experience interest and enjoyment, they feel competent and self-determining, they perceive the locus of causality for their behavior to be internal, and in some instances they experience flow [15].

Many studies have extended TAM to include intrinsic motivations. Previous studies have verified that if

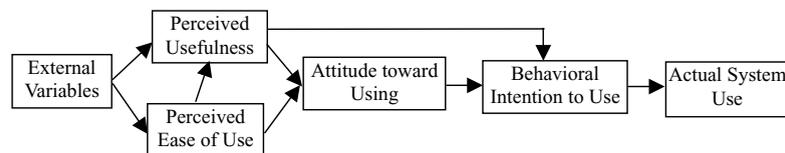


Fig. 1. Technology acceptance model.

users are more playful with their computer systems, they will be more willing to use them [24,45]. Computer playfulness was defined as a state termed flow to describe the characteristic of the interaction between the user and the system [49,50]. Flow is a psychological state in which an individual feels cognitively efficient, motivated, and happy, and it is defined as the holistic sensation that people feel when they act with total involvement [38]. Users experience optimal flow when both the challenge and their skills are high.

It is a multi-dimensional construct and the dimensions include intense concentration, a sense of being in control, a loss of self-consciousness, and a transformation of time [10]. However, the factors that induce flow are diverse and some related constructs have been proposed: their validity needs to be verified in empirical studies. For example, cognitive engagement was proposed as the flow without a notion of control [48]. Agarwal and Karahanna [2] also defined a construct termed cognitive absorption as “a state of deep involvement with software,” that was composed of the dimensions of temporal dissociation, focused immersion, heightened enjoyment, control, and curiosity. All these variables represent different forms of intrinsic motivation.

Flow has also been used to describe consumers' experiences in a hypermedia environment and used with TAM to study the impact of perceived playfulness on the acceptance of WWW [8]. When in the flow state, irrelevant thoughts and perceptions are screened out and the user's attention is focused entirely on the interaction; the resulting state of mind is extremely gratifying [20]. Although previous research usually assumed that flow would be more likely to occur during recreational activities, and that the benefits of on-line shopping was instrumental, the study of Hoffman et al. [21] found there was evidence that flow occurred under both experiential and goal-directed consumption, and that there was more evidence of flow for task-oriented than experiential activities.

2.3. Fashion

Social influence may also affect behavior. According to the TRA model, an individual's behavior intention is directly determined by both the attitude and the subjective norm of the individual, which refers to “the person's perception that most people who are

important to him think he/she should or should not perform the behavior in question” [17]. The social influence processes were also mentioned in TAM2, proposed by Venkatesh and Davis. In this, the effects of subjective norm on perceived usefulness and behavior intention are assumed to be mediated by the image of the person in the reference group and also moderated by the person's experience and the voluntary nature of the behavior [47]. Empirical evidence also supports the conjecture that social influence affects user's beliefs about a new technology [29].

Shopping is a voluntary behavior and different from the use of, software packages and e-mail, which were the general objects studied in previous research. B2C electronic commerce has been reported and advertised widely in the mass communication media and shopping on-line has been viewed as a symbol of “wired lifestyle” [9]. So, we have assumed that shopping is a fashionable behavior and thus used fashion involvement to conceptualize the effects of social influence.

Fashion is the process of adopting symbols primarily to provide an individual with a distinctive identity [40]. Fashion can be defined as “a way of behaving that is temporarily adopted by a discernible proportion of members of a social group because that chosen behavior is perceived to be socially appropriate for the time and situation” [44]. The fashion decision process can be considered to consist of six motivating constructs: strength of a priori preferences, selective influence, group membership/conformity, individuality/differentiation, desire to be current, and attitude toward change [37].

3. Research model

Fig. 2 shows our research model. We investigated the effect of the determinants of attitude on actual on-line shopping behavior in order to simplify the model. Perceived ease of use referred to whether the user found it was easy to search for the products he or she wanted to buy when shopping on line, to make the buying decision, to proceed with and pay for the transaction, and to obtain the products, including any after-sales services. Perceived ease of use would influence the attitude, intention, and consequently the actual on-line shopping behavior. When people feel it

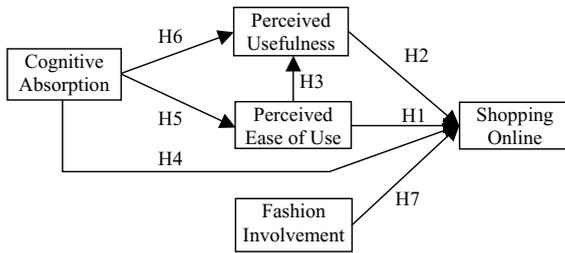


Fig. 2. Research model.

ease, they will be more likely to shop. Therefore, we proposed:

Hypothesis 1. Perceived ease of use of on-line shopping is positively related to on-line shopping behavior.

Perceived usefulness of on-line shopping means that the user's beliefs about whether he or she, when shopping on line, can search for and compare products, get information and a lower price, and thus gain more from the transaction [1]. The notation of perceived usefulness of on-line shopping assumes that on-line shop is a goal-oriented activity. Perceived usefulness also can influence the attitude, intention, and actual on-line shopping behavior. When people feel it is useful, they will be more likely to shop on-line. So we proposed:

Hypothesis 2. Perceived usefulness of on-line shopping is positively related to the on-line shopping behavior.

The effects of perceived ease of use on perceived usefulness have been proposed and tested by many studies. If the user believes it is easy to search for the information and make a buying decision on-line, he or she will be more likely to believe that advantages result from on-line shopping. Therefore, we proposed:

Hypothesis 3. Perceived ease of use of on-line shopping is positively related to perceived usefulness of on-line shopping.

Some studies have assumed perceived playfulness to be the mediator between perceived ease of use and system usage [19,39,46]. Perceived playfulness, as an intrinsic motivation, can also be an independent determinant of system usage and not related to perceived

usefulness and perceived ease of use [26]. We used cognitive absorption to conceptualize flow experience as a state of perceived playfulness and tried to focus on the impact of intrinsic motivations on on-line shopping. We tested both the direct and indirect effects of perceived playfulness on on-line shopping. However, cognitive absorption experience was extended to the general on-line experience because designers of e-tail outlets are not generally paying much attention to the effects of entertainment. For a direct effect, users who have experienced cognitive absorption on-line will be more likely to have a positive attitude toward on-line shopping and be more likely to shop on-line. So, we proposed:

Hypothesis 4. User's on-line experience of cognitive absorption is positively related to the on-line shopping behavior.

Cognitive absorption can also influence on-line shopping indirectly through its effect on perceived ease of use and perceived usefulness. The intrinsically motivating state of cognitive absorption will lower the perceived cognitive burden associated with the task: the individual is experiencing pleasure and is willing to expend more effort on it. The lower cognitive burden will result in amplifying perceived ease of use. Therefore, we proposed:

Hypothesis 5. User's on-line experience of cognitive absorption is positively related to the perceived ease of use of on-line shopping.

The state of cognitive absorption will also amplify belief about usefulness due to the effect of cognitive dissonance. While the users spend their time and enjoy the pleasure of interaction with the system, a majority of social environments reward instrumental outcomes more than the web. People have to rationalize their efforts by attributing instrumental value to them to reduce cognitive dissonance. So this leads to:

Hypothesis 6. User's on-line experience of cognitive absorption is positively related to the perceived usefulness of on-line shopping.

In our study, we assumed that because of extensive advertising and reports in the mass media, shopping

on-line has been seen as a symbol of a new life style and socially appropriate behavior. Consumer's fashion involvement, or the extent to which one's behavior is affected by a fashion trend, may be one of the major sources of social influence that affect a person's attitude toward on-line shopping. We therefore tested the direct effect of fashion involvement on on-line shopping behavior, proposing:

Hypothesis 7. User's fashion involvement is positively related to the on-line shopping behavior.

4. Methodology

4.1. Measurement

Scales that measure the constructs were developed using previous studies whenever possible; they are shown in the appendix. Actual on-line shopping behavior were measured by a binary variable asking whether the subject has shopped on-line and a multi-item scale (SHOP) for the intensity of on-line shopping, depending on the frequencies, times, and amount of money spent on-line. Scales of perceived ease of use and perceived usefulness were modified from the rigorously validated items developed by Davis [11], based on the EKB (Engel–Kollat–Blackwell) model of consumer's decision process [16]. This is a stage model that describes how a consumer decides to buy a product. In order to improve our construct validity, we extended the original scales to describe the efforts and benefits in different stages of the model. There were 12 items for perceived ease of use (PEOU) and 6 for perceived usefulness (PU).

The scale of the multi-dimensional construct cognitive absorption (CA) was adopted from the original work of Agarwal and Karahanna. However, due to the problem of semantics in translating, some items were dropped or modified after a pre-test and this resulted in 14 items. Finally, a five-item scale was developed for fashion involvement (FI) based on the works of McIntyre and Miller [36]. All of the items were measured on a five-point Likert-type scale, except those for cognitive playfulness, which were transferred into seven-point semantically differential items, to reduce semantics problems in translating.

4.2. Data collection

A survey was conducted to test the research model. There were two sources of samples. First, in order to target potential on-line consumers, a Web-based survey was employed. An electronic mail message that explained the objectives of the research and contained the link to the Web-based survey was sent to members of a mailing list compiled by a major computer magazine in Taiwan¹. Four hundred and ninety five responses were returned; of these, 478 were complete.

Three hundred and eighteen respondents in the sample had shopped on-line. However, probably due to the problem of sample size, the structural equation modeling analysis of these subjects did not converge. Previous experience by the magazine suggested that a convenience sample of students also was needed². The participants from three universities were asked to complete the survey after their classes. Thousand surveys were distributed and 750 were collected; of these, 650 were complete. In total there were therefore 1128 samples in our study. In all, 523 respondents had shopped on-line, about 46% of the total. The proportions of respondents who had shopped on-line were not the same, while 318 of 478 respondents in the web-based survey had shopped on-line, only 205 of the 650 respondents in the student samples had. This might indicate that the subjects in the web-base survey were more experienced network users than the subjects in the student samples. 58.2% of the respondents in our sample were male; 62.5% were aged between 15 and 25, 78.5% were single, 62.6% had an income of less than \$NT 20 000 per month (about US\$ 600). Except for the low income, the composition of our sample was similar to the result of the survey for the portfolio of

¹This magazine is published by the Institute for Information Industry (III), founded by Taiwan's government to assist industrial firms to increase their competitiveness. The e-mail list was not just of the readers of the magazine, but is a sample of the Internet population in Taiwan. The publisher uses this list to conduct related surveys. For reasons of privacy and security, we were not allowed to use the mailing list directly; III conducted the survey. So the response rate is unknown.

²The director of the magazine suggested that the authors collect samples from other sources because the normal response rates of previous surveys ranged from 5 to 15% and it would not be easy to increase the response rate. Thus, convenience samples were needed.

populations on the Internet as conducted by Yam.com, a popular portal site in Taiwan.

5. Analysis and results

There were four parts of our analysis. First, validity and reliability of the measurement model were tested by factor analysis and Cronbach's α . Second, the causal structure of the proposed research model was tested using structured equation modeling (SEM). Third, nested model comparisons were conducted to test whether the research model significantly fit the data better than alternative models. Fourth, one of the measures of our dependent variable, actual on-line shopping behavior, was binary: it asked whether the responder had ever shopped on-line; we therefore also conducted a logistic regression analysis to find out factors that affected whether one would shop on-line and to determine whether these factors were different from those that affected the intensity of shopping on-line for people who had on-line shopping experience.

5.1. Measurement model

The factor analysis with varimax rotation was used to test the validity of the multi-dimensional construct cognitive absorption, under the condition that the number of factors was five, as assumed by the measurement model. However, in Table 1 only seven items located in the predicted dimensions, the allocations of the items were not consistent with the dimensional structure of cognitive absorption proposed by Agarwal and Karahanna, especially for the dimensions—heightened enjoyment, control, and curiosity.

Further, a principal components factor analysis with orthogonal rotation by varimax method was conducted. Factors with eigenvalues larger than one were

Table 2

Factor structure of principal components analysis for cognitive absorption

Items	Factor 1	Factor 2	Factor 3
CA10	0.74		
CA14	0.72		
CA6	0.71		
CA13	0.70		
CA11	0.70		
CA12	0.69		
CA7	0.67	0.38	
CA8	0.64		
CA2		0.73	
CA1		0.70	
CA4	0.44	0.47	
CA5			0.79
CA3			0.71
CA9			0.63

Note: Suppress absolute values <0.3.

extracted, resulting in three factors. Table 2 presents the factor structure of the principal components analysis for cognitive absorption. Item CA4 was dropped because the difference of the factor loading of CA4 on factors 1 and 2 was less than 0.1. However, as shown in Table 3, the reliability of factors 2 and 3 was low with Cronbach's α of 0.43 and 0.52, respectively, and so these factors were dropped in succeeding analyses. Comparing Table 3 with Table 1, factors 2 and 3 mainly presented the constructs of temporal dissociation and focused immersion. Items of these constructs might be inappropriate for describing users' on-line experiences because users sometimes conduct several tasks simultaneously and switch attention quickly when they surf the Internet. On the other hand, factor 1 presented the heightened enjoyment, control, and curiosity dimensions in the original model and resulted in high reliability. Problems in the factor analysis indicated that the discrimination among the

Table 1

Items allocation in the CFA for cognitive absorption

Dimensions	Predicted items	Results of CFA
Temporal dissociation	CA1, CA2	Factor 1 CA1, CA2
Focused immersion	CA3, CA4, CA5	Factor 2 CA3, CA5
Heightened enjoyment	CA6, CA7, CA8, CA9	Factor 3 CA4, CA7, CA13
Control	CA10, CA11	Factor 4 CA9
Curiosity	CA12, CA13, CA14	Factor 5 CA6, CA10, CA12, CA8, CA11, CA14

Note: The characters in bold italics indicates the item located in the same dimension as the predicted one.

Table 3
Reliability analysis for the factors of cognitive absorption

Factors	Items	Cronbach's α
Factor 1	8	0.86
Factor 2	2	0.43
Factor 3	3	0.52

Table 4
Reliability analysis for PEOU, PU, and FI

Constructs	Items	Cronbach's α
Fashion involvement	5	0.77
Perceived ease of use	10	0.82
Perceived usefulness	6	0.76

three dimensions was not significant. We used factor 1 as the measurement of cognitive absorption. However, the notion of cognitive absorption was different from the original one and only included dimensions of heightened enjoyment, control, and curiosity.

Construct validity of the other dependent variables (perceived usefulness, perceived easy of use, and fashion involvement) were also tested by factor analysis with varimax method. PEOU8 and PEOU10 were dropped, because the differences between the factor loadings of these items on perceived ease of use and perceived usefulness were less than 0.1. Table 4 shows the resulting reliability of perceived ease of use, perceived usefulness, and fashion involvement.

5.2. Structural model

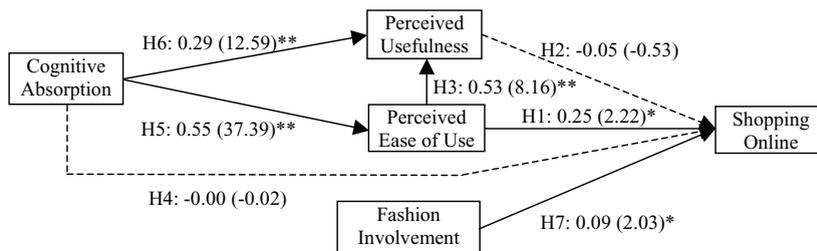
The causal structure of the research model was tested using SEM. In total 523 samples of data from

Table 5
Fit measures for the structural model

Fit indicators	Criteria (P)	Results
Chi-square	≥ 0.05	1229 ($P \leq 0.01$)
Chi-square/d.f.	≥ 3	2.89
Goodness-of-Fit Index (GFI)	≥ 0.9	0.97
Adjusted GFI (AGFI)	≥ 0.9	0.97
Normed Fit Index (NFI)	≥ 0.9	0.98
Non-Normed Fit Index (NNFI)	≥ 0.9	1.01
Comparative Fit Index (CFI)	≥ 0.9	1.00
Root Mean square Residual (RMR)	≤ 0.05	0.036

respondents who had shopped on-line were analyzed using the non-weighted least squares method in LISREL to test the SEM. The goodness-of-fit indices for this model are shown in Table 5 and all measures satisfied the criteria of good fit, except for the Chi-square. However, this statistic is sensitive to large sample sizes and tends to reject the model for trivial discrepancies between a model and data, resulting in significant Chi-square values [42]. Because the data was based on a relatively large sample, other measures of goodness-of-fit instead of Chi-squares should be considered. Therefore, results of the analysis indicated a good fit between the structural model and the data.

Fig. 3 illustrates the results of the structural model and details of the statistics. Results of the analysis support H1 and H3. Both effects of perceived ease of use on perceived usefulness and on-line shopping were sustained. However, Hypothesis 2 of the effect of perceived usefulness on on-line shopping was not supported by the data. Hypothesis 4 was rejected and Hypotheses 5 and 6 were supported. These results indicated that on-line experience of users on cognitive



Note: path coefficient (t-value);
* Significant at 0.05, ** Significant at 0.01; Dotted line means not significant

Fig. 3. Results of the structural model and hypothesis tests.

absorption would affect the perceived ease of use and perceived usefulness of on-line shopping, but would not affect their on-line shopping behavior directly. Thus cognitive absorption experience would affect on-line shopping only indirectly through the mediation of perceived ease of use.

Finally, the study also supported Hypothesis 7, but the correlation is very low and accounted for a very small percent of the variance. Users whose consumption is more easily affected by fashion trend may be more likely to shop on-line.

5.3. Model comparisons

This study extended TAM by adding two variables, cognitive absorption and fashion involvement, to explain on-line shopping. Although the results show that our research model fit the data, the focus of assessing model fit should be still in comparing the fit with alternative competing and theoretically plausible models [30]. We used the model trimming strategy for nested model comparison to test whether our model significantly contributed to the fit of the data better than simpler ones. The analysis was begun with our model as the start (the original model) and simplified it by eliminating paths. Three alternative models were proposed in the nested comparisons. First, the impact of fashion involvement on on-line shopping, Hypothesis 7, was eliminated. Although it is supported in Table 5, the t-value is just in the margin. So Hypothesis 7 was dropped in model I to test if the explanatory variable fashion involvement truly contributed to the fit of the data. Second, all of the impacts of cognitive absorption, Hypotheses 4–6, were eliminated in model II. Third, for model III only TAM was included with Hypotheses 4–7 dropped. Models I–III were all nested in the original model.

As shown in the results of the Chi-square difference test of Table 6, the difference between the original model and model I is not significant. Therefore, the impact of fashion involvement can be dropped. However, the Chi-square of the original model was significantly lower than the Chi-squares of models II and III. Thus the impact of cognitive absorption really contributes to the fit of the data in our research model, which extends TAM by adding the impacts of intrinsic motivations, fits the data better than pure TAM. The Parsimony Goodness of Fit Index (PGFI) also indicated that the models with the effects of cognitive absorption included really provided a better fit. On the other hand, the models with the effect of fashion involvement did not result in a better PGFI.

5.4. Logistic regression

We used actual behavior instead of behavior intention as the dependent variable in the SEM. As only 523 of the total of 1128 respondents had shopped on-line and were tested in the structured model, we also conducted a logistic regression analysis of the whole to find out the factors that affected whether one would shop on-line. Logistic regression was used because the dependent variable model was binary and used to predict the conditional probability of the dependent variable. Except for the variables in the structural model, the logistic regression contained three other predictor variables: income level, how long (experiences) and how often (frequencies) the user used WWW. The conditional probability can be defined as

$$p = P\left(Y = \frac{1}{X}\right),$$

where X was the vector of the explanatory variables, and $Y = 1$ meant the respondent had shopped on-line.

Table 6
Summary of the nested model comparisons

	Path eliminated	Chi-square	Degree of freedom	PGFI	Compare with the original model	
					Chi-square/d.f.	P
Original model		1229	426	0.83		
Model I	H7	1232	427	0.84	3/1	ns
Model II	H4, H5, H6	1372	429	0.71	143/3***	<0.001
Model III (TAM)	H4, H5, H6, H7	1377	430	0.71	148/4***	<0.001

Table 7
Results of the logistic regression

Variables		Coefficients	WALD
Intercept		-5.86**	81.87
Income level	X_1	0.64**	53.68
Perceived ease of use	X_2	0.67**	21.02
Fashion involvement	X_3	0.48**	11.85
State of cognitive absorption	X_4	-0.38*	6.71
Frequencies	X_5	0.31**	14.75
Experiences	X_6	0.25**	41.24

* $P < 0.05$.

** $P < 0.01$.

The logistic regression was conducted by a forward stepwise procedure, and the Wald Coefficient was used as the criteria of significance. Results of the analysis are given in Table 7. The regression model was:

$$\ln\left(\frac{p}{1-p}\right) = -5.86 + 0.64X_1 + 0.67X_2 + 0.48X_3 - 0.38X_4 + 0.31X_5 + 0.25X_6$$

The accurate prediction rate of the model was about 71%. All the variables, other than perceived usefulness, were significant in the final model. This result was the same as that of the structural model. Also, the three additional individual factors (income level, experience, and the frequency of the user having used WWW) were significant. However, the effect of cognitive absorption on the probability that the respondent would have shopped on-line was negative. This is possibly due to the high correlation between perceived ease of use and cognitive absorption, as these two were in the final regression model as explanatory variables.

6. Discussion and implications

Previous researchers usually assumed that on-line shopping was a goal-oriented task: consumers knew what they are looking for; they could therefore search quickly for the product and make their decision. However, we found evidence to the contrary: intrinsic motivations were the major reason for consumers to shop on-line and that the effect of extrinsic motivations were not significant. These results were found to be true, both for the model to explain the intensity

of on-line shopping and the dichotomous variable whether to shop on-line or not.

The core formulations of TRA and TAM have argued that the effects of all external variables are mediated by an individual's cognitive beliefs. This argument was still sustained by our study. The effect of cognitive absorption was mediated by perceived ease of use. Perceived usefulness was not the reason for consumers to shop on-line. Gefen and Straub [18] summarized past research using TAM and concluded that perceived usefulness affected the intended adoption of IT, but that it failed to do so for perceived ease of use. They argued that perceived usefulness should relate to the adoption of IT for an extrinsic task and, conversely, that perceived ease of use should affect IT adoption only when the IT itself provided the primary product or service. Our results were consistent with this in that the effect of perceived ease of use was related to the intrinsic motivation.

The study by Johnson and Hignite [28] also found that perceived usefulness had no effect on the use of the WWW. They argued that this might be due to the changed focus on personal use of the WWW in contrast to work-related use in previous studies. Personal use may be useful if it satisfies one's curiosity or entertains, while end user systems in the workplace may allow one to retain the job or obtain promotion. However, our study showed shopping on the Internet was still motivated by the entertaining and not economic factors.

Intrinsic motivations may be more important than extrinsic ones in on-line shopping. This suggests that compared to the massive and convenient brick-and-mortar stores, the advantages of on-line buying are not as obvious as was previously thought. Also, there are problems in network security, risk of transactions, and uncertainty about the sales service when shopping on-line. Such barriers are major challenges for on-line stores. Our result may also confirm the arguments proposed by Schmitz and Latzerb [41] that the goods sold in B2C e-commerce are heterogeneous "composite goods" and that market transparency is lower than has been assumed.

Shopping is an important activity for some people. Results of our study indicated that people who had a cognitive absorption experience on WWW were more likely to shop on-line. So, it would be important for

e-tailers to try to keep them on-line as long as possible. For example, consumers could spend time in Internet book or CD stores looking at samples and readers' reviews, or they could try combinations of dresses and personal accessories in an on-line fashion store. On-line communities providing a virtual space for social interaction can also be attractive for people with special interests. On-line shops can also provide little games for the consumers or allow lots to be drawn for special discounts or gifts. Brown [6] even mentioned the idea of retro-marketing; that retailers should try to excite their consumers by creating demands for products based on their exclusivity, secrecy, amplification, entertainment, and even tricks.

Finally, our study indicated there might be a relationship between consumers' fashion involvement and their intensity to shop on-line. Although the impact of fashion involvement did not significantly contribute to the fit of data, the symbolic meaning of on-line shopping, and the impact of fashion is partly shaped by the firms involved.

7. Limitations

People shop for fun and spend their time, both for shopping in brick-and-mortar markets and on the Internet. However, due to limitations of our study, readers should interpret its results with caution.

First, the theoretical dimension of cognitive absorption was not supported. Results indicated that the users' responses of temporal dissociation and focused immersion were not reliable and that the effects of heightened enjoyment, control, and curiosity were not substantial. This result may be due to semantic problems in translation and that the meaning of cognitive absorption in this study was not the original one.

Second, subjects of this study were gathered from two sources and were not sampled randomly from a specific population. So the results could only be seen as exploratory. Even though the demographics of our samples are similar with the result of a survey of the portfolio of populations on the Internet, the majority of the samples still came from students. Although they are major users of the WWW, their shopping behavior is not the same as normal web-users with a higher income and less free time [5].

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Appendix A. Scales and Items

Cognitive Absorption

- | | |
|------|--|
| CA1 | Time appears to go by very quickly when I am using the Web. |
| CA2 | I often spend more time on the Web than I had intended. |
| CA3 | While using the Web, I am able to block out most other distractions. |
| CA4 | While on the Web, I am immersed in the task I am performing. |
| CA5 | When on the Web, I get distracted by other attentions very easily. |
| CA6 | I have fun interacting with the Web. |
| CA7 | Using the Web provides me with a lot of enjoyment. |
| CA8 | I enjoy using the Web. |
| CA9 | Using the Web bores me. |
| CA10 | I feel that I have control over my control with the Web. |
| CA11 | The Web allows me to control my computer interaction. |
| CA12 | Using the Web excites my curiosity. |
| CA13 | Interacting with the Web makes me curious. |
| CA14 | Using the Web arouses my imagination. |

Perceived easy of use

- | | |
|-------|---|
| PEOU1 | I can quickly find the Web stores I want when I go on the Internet. |
| PEOU2 | Interfaces of Web stores are user friendly. |
| PEOU3 | Waiting time on the Web stores is short. |
| PUOU4 | There are many useful tools for shopping on the Web stores. |
| PEOU5 | The process of transaction on the Web is convenient. |
| PEOU6 | Requests on the shopping Web are easy and effective. |

- PEOU7 I can easily find the product I want when shopping on the Web.
- PEOU8 It is easy to search for the product information when shopping on the Web.
- PEOU9 We can trust the brand and reputation of the stores on the Web.
- PEOU10 I can more easily buy a product on-line with better quality than in the traditional stores.
- PEOU11 The delivery for products bought on the Internet is speedy on average.
- PEOU12 The deliveries, returns, and after sale services of the transaction on-line are satisfactory.

Perceived usefulness

- PU1 Products sold on the Internet have a greater variation than products sold in traditional stores.
- PU2 On-line stores provide more information about the price, features, and quality of the products than provided via the traditional channels.
- PU3 Comparing with on the physical channel, shopping on the Internet takes less time, from the search for the products to the end of the whole transaction.
- PU4 When shopping on the Internet, it is easy to compare the differences among various products.
- PU5 When shopping on the Internet, I can find some products that are not easy to be found in the physical stores.
- PU6 The discounts and promotions of shopping on the Web are often attractive.

Fashion involvement

- FI1 I like to gather information about the current trend in some specific fields.
- FI2 If I get the chance, I would like to try the activities in which the others are engaged.
- FI3 I would pay attention to the trend in society, and have the courage to present myself as the trend.
- FI4 I would consider the social meaning of my behavior before I proceed.
- FI5 I would try the present myself as the most up-to-date trends.

Note: The original instrument was in Chinese.

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