

# Discussion on the Behavior Intention Model of Consumer Online Shopping

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*The objective of this study was to test the sufficiency of the Theory of Planned Behavior (TPB) and extended TPB models by looking at the added variables of past experience and channel knowledge in predicting consumer online shopping. Data was collected by questionnaire from employed students in junior college and university (n=334), and by web-based survey from Internet users (n=92). Using Multi-regression analysis, the results of the study demonstrate that the TPB is applicable to measuring behavioral intentions in online shopping. Furthermore, adding past experience and channel knowledge to the TPB model improves the prediction of online shopping behavior.*

People's shopping habits have changed. According to the forecasting of Forrester Research, by 2010, online sales will reach \$331 billion in America. The growing number of online shopping households combined with retailer innovations and website improvements will drive e-commerce to account for 13% of total retail sales in 2010, up from 7% in 2004. Between 2004 and 2010, online sales will grow at a 15% compound annual growth rate (Johnson, 2004). In addition, MIC of the Institute for Information Industry estimated online shopping in 2003 was \$0.6 billion (NT\$20.4 billion), and would grow by 30% to \$0.81 billion (NT\$26.6 billion), and increase by 88% in 2005 to \$1.52 billion (NT\$50.1 billion) in Taiwan. Currently, online shoppers in Taiwan only represented 20% of the Internet population. Compared with America in which B2C e-business accounted for 1.5% of total retailing sales, B2C in Taiwan (0.39% of total retailing sales) still had a large growth space (Wu, 2004). As the

Internet becomes an increasingly common medium for consumer transactions throughout the world, it becomes increasingly important to identify the factors affecting consumer adoption of e-commerce.

Several studies (James & Cunningham, 1987; Scansaroli, 1997; Li, Kuo, & Russell, 1999; Chen, 2000; Abend, 2001) explore the factors affecting consumer online shopping. But, Goldsmith (2001) claims that a lot of research concerning online consumer behavior is rather descriptive in nature and not based on consumer theory. One aim of this study, therefore, is to use consumer theory to predict consumer online shopping behavior intention.

According to the research of Bagozzi (1981) and Shimp and Kavas (1984), the TPB in attitude and behavior could be applied to research in different fields, and it could also help to clearly understand the effects of every dimension of the behavior intention. For example, TPB has been applied in a number of areas: decision making (Venkatesh, Morris, & Ackerman, 2000), environment protection (Cordano & Frieze, 2000), science and technology (Morris & Venkatesh, 2000; Gary, Franklin, Alan, & Mohammed, 1995), marketing (Huff & Alden, 2000; Shaoyi, Yuan, Huaiqing, & Ada, 1999; Shirley & Peter, 1995), and health behavior (Armitage & Conner, 2001). However, applications toward online shopping are rare.

In addition, some prior studies have challenged the assumption that the three variables in the TPB model are sufficient in order to predict behavioral intentions. Some argue that additional variables could further enhance the model's predictive utility and significantly improve its predictive power (Conner & Armitage, 1998; Norman, Conner, & Bell, 1999). For this reason, the study adds online purchase experience (Steven, Gerald, & Eric, 1999; Gerald et al., 2000) and Channel Knowledge (Li, et al., 1999) to further enhance its predictive power. Therefore, the purpose of the study is two-fold: to apply TBP to the online shopping area and to extend TPB models in predicting consumer online shopping behavior.

We will first provide a detailed discussion of the TPB and hypotheses, develop the research methodology, present the results, and finally discuss the implications of the study and provide suggestions for further research.

## Theory, Literature Review and Hypotheses

### *The Theory of Planned Behavior (TPB)*

The Theory of Planned Behavior (Ajzen, 1985; 1988; 1991) was developed from the extension of the Theory of Reasoned Behavior (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). However, assumptions put forward by the TPB were basically identical to those of the Theory of Reasoned Behavior. The main difference is that TPB explains that all human behavioral decisions are not completely controlled by personal will, but are somewhere between being completely and incompletely controlled by personal will. Therefore, TPB added one decision factor of uncertain time and chance, i.e. the so-called Perceived Behavioral Control (PBC). This factor would not only indirectly affect behavior through behavior intention, but also directly affect behavior. The TPB could be expressed by the following equation (1):

$$BI = \beta_1 * ATT + \beta_2 * SN + \beta_3 * PBC \dots\dots\dots (1)$$

Where BI refers to behavior intention, ATT refers to attitude toward the behavior, SN refers to subject norm, and PBC refers to perceived behavioral control.  $\beta_1$ ,  $\beta_2$ , and  $\beta_3$  are empirical standard multi-regression coefficients.

First, behavior intention was defined as the intention or motive one has when trying to adopt a specific behavior. The theory explains that the most direct deciding factor when one adopts a certain behavior is behavior intention, and considering all possible factors affecting behaviors indirectly through behavior intention. Behavior intention was the best method to predict individual behavior, while behavior intention was highly correlated with behavior (Ajzen, 1991).

The theory further explains that the first deciding factor affecting behavior intention is attitude toward the behavior, i.e. the overall evaluation of this behavior. This attitude does not refer to attitudes toward general affairs, but rather to particular attitudes toward the behavior in question. According to the research on empirical rules, an individual often has five to nine important beliefs (Ajzen & Fishbein, 1980). In TPB, attitudes (ATT) are calculated by multiplying the strength of each behavioral belief by the subjective evaluation of the belief's attribute. The function was as follows; equation (2). Behavioral belief refers to the individual's belief that certain, specific behaviors will result in some consequences. Outcome evaluation refers to the importance of the behavior result to the individual. Therefore, attitude is a combination of the individual's idea of the result of a certain behavior and that individual's evaluation of those results. In other words, attitude is determined both by the consequence that the individual believes will result from a behavior compared with other behaviors, and the importance of the results to the individual. When the individual's attitude to behavior is more positive, the behavior intention will be higher. On the contrary, when the individual's attitude to behavior is more negative, the behavior intention will be lower.

$$ATT = \sum E_j * B_j \dots\dots\dots (2)$$

Where  $B_j$  refers to the individual's belief of the result  $j$  caused by adopting this behavior and  $E_j$  refers to the individual's evaluation of result  $j$  after adopting this behavior.

The second deciding factor of the theory is subject norm (SN), i.e. the effects of salient individuals or groups (social pressure) on individuals on whether to take certain behaviors when predicting individual behavior. As stated by the TPB, subject norm is calculated by multiplying the strength of each normative belief by the person's motivation to comply with the referent in question, as shown in the equation (3) below. Normative belief is defined as the opinions of other individuals and groups and/or social pressure as perceived by an individual in reference to certain behaviors. The motivation to comply referred to the comply intention to the expectation of salient individuals or groups when the individual has certain behaviors. Subject norm is the individual's belief in the opinions by the salient individuals or groups on whether the individual should take certain behaviors. Therefore, the subject norm is decided by a normative belief of other individuals and groups on the individual taking

certain behavior, and individual motivation to comply. In other words, when either social pressure or motivation to comply is higher, the subject norm and behavior intention is also higher. In contrast, when social pressure or intention to comply is lower, the subjective norm and the behavior intention is lower.

$$SN = \sum MC_j * NB_j \dots\dots\dots (3)$$

Where  $NB_j$  refers to an individual's belief that the important reference subject as to whether he/she should have certain behaviors and  $MC_j$  refers to an individual's motivation to comply with the important reference subject.

Finally, the third deciding factor of this theory is perceived behavioral control (PBC). Ajzen (1988) believes that behavior control belief can not only predict behavior intention, but also directly predict behavior. As stated by the TPB, perceived behavioral control is the sum of the multiplication of each control belief by the perceived power of a particular control factor to facilitate or inhibit behavioral performance, as shown in the equation (4) below. Control belief refers to the control degree of chance and resources needed for taking behaviors, also the cognition of individuals on the resources, chances, and barriers on taking certain behaviors. Perceived facilitation refers to the individual's belief on effects of behaviors by chances and resources needed or barriers.

$$PBC = \sum PF_j * CB_j \dots\dots\dots (4)$$

Where  $CB_j$  refers to the belief as to whether necessary technology, resources, chances  $j$  for certain behaviors are available and  $PF_j$  refers to the individual perceived affecting degrees on obtaining this technology, resources, and chances.

In short, according to TPB, we can predict if an individual's thought process about adopting a particular behavior will lead him/her to expect certain consequences. Also, if important social pressure groups or individuals believe he/she should follow this particular behavior, if he/she will be very willing to comply with their opinions. Further, if the individual feels he/she easily can control this behavior, and that there are few barriers to doing so, that individual will form the intent to pursue this behavior. Therefore, from the perspective of individual behavior changes, if we can understand the deciding factors between behavior intention and actual behavior, then it will greatly benefit and help us understand behavioral change.

**Literature Review**

According to Goldsmith's (2001) research, Goldsmith claims that much research concerning online consumer behavior is rather descriptive in nature and not based on consumer theory. The first area of research relevant to TPB was about convenience and transportation. For example, James and Cunningham (1987) believed that online shopping consumers paid more attention to the convenience of shopping. On the Internet, consumers can make purchases 24 hours a day without the limitations of location and national boundaries. It is also convenient to purchase foreign goods, without having to endure the transportation hassles of traditional shipping methods

(Scansaroli, 1997). Similarly, Li, Kuo, and Russell (1999) and Swaminathan, Lepkowska-White, and Bharat (1999) pointed out that the Internet provide consumers with a more convenient shopping method to save time. Therefore, the more emphasis that the consumer puts on convenience, the more likely it is that the consumer will choose online shopping. Also, by searching online consumers can quickly find the products they want, information on relevant products, and can reduce the time and effort spent searching for information (Ainscough & Luckett, 1996; Klein, 1998; Scansaroli, 1997).

Literature also exists on the other positive aspects to shopping online. For example, Alba et al (1997) and Scansaroli and Eng (1997) discovered that to some consumers with little shopping experience, who did not like to make purchases on the street or in stores, the anonymity of online shopping allows them to enjoy shopping without any negative influence by the external environment. Alba et al. (1997) and Scansaroli and Eng (1997) pointed out that the anonymity of the Internet allows consumers to purchase privately products that may embarrass them to purchase in public, or to purchase products about which they do not want others to know. The Internet also offers more goods and services, and it is easier to purchase new, unique or special products not available in typical retail stores. It also helps consumers research products needed in the future, and satisfy particular interests and habits (Peterson, Balasubramanian, & Bronnenberg, 1997; Larcener, 1999).

From the relevant literature on online shopping cited above, we see that when an individual's attitudes are more positive toward online shopping, the resulting behavior intention is higher. On the contrary, when an individual's attitudes are more negative, then the behavior intention is lower. Therefore, this study puts forward the following hypothesis:

*H1: The higher the positive attitude to online shopping, the higher the behavior intention of purchasing online.*

Regarding the second component of TPB, subject norm (SN), research by Hansen, Jensen, and Solgaard (2004) found that an online shopper would be influenced by family members, friends, and acquaintances regarding whether or not to shop online. In other words, the higher the social pressure faced by an online purchaser or the higher the motivation to comply, then the higher the subject norm and behavior intention would be. On the contrary, the lower the social pressure, or the lower the motivation to comply, then the lower the subject norm and behavior intention would be. Therefore, the study put forward the following hypothesis:

*H2: The more positive the subject norm belief for online shopping, the higher the behavior intention for online shopping.*

Moving to the third component of TPB, personal behavioral control (PBC), issues arise regarding individual data confidentiality and security. Freehill, Hollingdale & Page (2000), pointed out that 18% of websites had options to protect users' privacy, and 12% of websites had an online declaration for user's privacy. Only 6% of websites used external inspectors to examine privacy standard regulations. As website owners paid

less attention to the privacy and security of personal data, a consumer's intention to use online shopping was significantly reduced (Chen, 2000). Regarding hardware, most consumers complained that websites were difficult to browse, and it was difficult to find specific product services (Abend, 2001; Fram & Grady, 1997). In addition, Hoffman, Novak, and Peralta (1999) also pointed out that Internet users refused to shop online when they did not trust the security of transactions.

According to the Taiwan MIC (1997) of the Institute of Information Industry, among the reasons for consumers' refusal to shop online were that online shopping was not a habit for them, or they were suspicious of online transactions, complicated transaction procedures, inconvenient return or exchange policies, and/or acknowledged transaction standards. Also, according to a survey of CNET (2001), other reasons included that consumers could not find the products they wanted, found it difficult to find the shopping cart, thought it took too long to finish the transaction, believed online transactions were not safe, and felt that there was a long browsing time.

Therefore, we see that when individuals found that a behavior was easy to control, and there were fewer barriers and more assistance in this behavior, then the higher the behavior intention. On the contrary, the opposite conditions would result in a lower behavior intention. Therefore, the study has the following hypothesis:

*H3: The higher the positive perceived behavioral control the consumer has for online shopping, the higher the behavior intention for online shopping.*

#### **Past Experience**

Consumers' previous shopping experience affects future shopping decisions. Therefore, when consumers have more purchase experience with a given product, they acquire sophisticated product knowledge more easily (Childers, 1986). Previous purchase experience had similar affects on Internet users for the same reason. When consumers do after-purchase-evaluations, they generate relevant psychological feedback. Those experiences will continue to affect consequent shopping decisions (Schiffman & Kanuk, 1997). Therefore, the shopping decision is a circular feedback activity. Additional studies pointed out that the online shopping experiences affect purchase intention (Steven, Gerald, & Eric, 1999; Gerald et al., 2000).

Even though using the Internet to shop has only been possible for a few years, the more experiences that the consumer has on the Internet, the more likely it is that he/she will become an online shopper. The online shopping experience has some effect on consumer's shopping intention. Therefore, the study has the following hypothesis:

*H4: The more online shopping experience the consumer had, the higher behavior intention of online shopping.*

#### **Channel Knowledge**

A consumer's knowledge of various purchasing methods, or channel knowledge, may influence the shopping decision. As online shopping was an emerging consumption channel, Li, et al., (1999) believed that in addition to particular resources, Internet literacy was important to Internet shopping. The capability of using

the Internet to shop was called channel knowledge. The research also shows that, with improving channel knowledge, the intention to use online shopping also increases. Therefore, this study had the following hypothesis:

*H5: The more Internet channel knowledge the consumer had, the higher the behavior intention of online shopping.*

## Research Methodology

### *Procedures and Sample*

First, regarding the manipulation of the TPB, according to concept construction and scale table development of the Reasonable Behavior Theory of Ajzen and Fishbein (1980), manipulation of the tool in each composition scale can be divided into five steps. The first three steps are the theoretical structure of the TPB; the next two steps are the important behavioral belief of behavior intention (outcome belief, normative belief, and control belief). Therefore, the five steps are:

- 1) To choose the behavior under discussion, and define this behavior from action, the final objective, its connotation and time factors.
- 2) To define the corresponding behavior intention for this behavior.
- 3) To define related attitudes, subject norm and behavior control beliefs.
- 4) To conclude on important outcome belief, normative belief and control belief
- 5) Then according to the results in step four, to develop questions about composition scale of the theory (measurement indicators).

Therefore, we developed measurement indicators from three groups of on-the-job students (126) through non-structured questions (i.e., open-ended questions where there is no list of answers from which to choose, but respondents are simply asked to write their response to a question). Initial results were 18 items of ATT, 12 items of SN, and 24 items of PBC. To assess the impact of the items, two experts, three doctoral students, and one academic professor did the evaluation. Based on this pretest, several changes were made, and the final version of the TPB was created.

In the first part, from the question "What do you think are the benefits of online shopping?" we derived 12 relevant variables. In the second part, from the question "Which individuals or groups do you think will agree or disagree with your online shopping?" we derived nine relevant variables. In the third part, from "Which factors, status or occasions will prevent you from online shopping, or encourage your online shopping?" we derived 17 relevant variables.

Four hundred on-the-job students from junior college and university participated in this study. The subjects came from a variety of majors (Business Administration, MIS, Industry Management, and Accounting). Some were full-time students. After eliminating 66 questionnaires, there were 334 effective questionnaires. The response rate was 334/400 (83.5%). We also used online questionnaires with a total of 92 usable online questionnaires. In total, 426 questionnaires formed the basis of our data.

### Measures

*Attitude (ATT)*. Attitude refers to an individual's attitude towards online shopping. In manipulation, we designed through scale development with a reference of the suggestions of Ajzen and Fishbein (1980). Based on the above procedure, we developed 12 questions, modified by two experts, three Ph.D. students, and one academic professor to match the Internet shopping environment. Measurement questions all used the Likert 7-point scale: 1 represented very possible (important, approval, agree), 7 represented impossible (unimportant, disapproval, disagree).

*Subject Norm (SN)*. Subject norm refers to the social pressure the individual felt during online shopping. Just as for attitude, we developed nine questions, using the same Likert 7-point scale.

*Perceived Behavioral Control (PBC)*. Perceived behavioral control is the control capability on needed chance and resources when the individual performs online shopping. Similarly, we developed 17 questions on PBC, also all using the same Likert 7-point scale.

*Behavior Intention (BI)*. Behavior intention refers to when individuals intend to adopt certain behaviors (e.g. online shopping). Again, using the same procedure as above, we developed four questions, on the Likert 7-point scale.

*Past Experience (PE)*. Past purchase experience refers specifically to consumers' online shopping experience. Through scale development, with reference of suggestions of Steven, et al., (1999) and Gerald, et al., (2000), we developed 4 questions, modified by two experts, three Ph.D. students, and one academic professor to match the Internet shopping environment. Measurement questions all used the Likert 7-point scale: 1 represented strong agreement, 7 represented strong disagreement.

*Channel Knowledge (CK)*. Channel knowledge refers to a consumer's understanding of an online shopping website procedure and its relevant system. Through scale development, with reference of suggestions of Li, et al., (1999), we developed 6 questions, modified by two experts, three Ph.D. students, and one academic professor to match the Internet shopping environment. Measurement questions all used the Likert 7-point scale: 1 represented strong agreement, 7 represented strong disagreement.

### Controls

Based on previous research in this area, we chose as the control *gender*, *age*, and *education* (Greenfield Online, 1999; Li, et al., 1999; Donthu & Garcia, 1999; Yam, 2000). Greenfield Online (1999) showed that online shoppers were mostly males with a high income. Li, et al., (1999) concluded that the level of education would determine their intention to purchase online. The research result also showed that the level of education significantly correlated to shopping intention. In addition, Donthu and Garcia (1999) discussed the difference between the common consumer and the online consumer. The result was that there was a significant difference on age and income, but no significant difference in education and gender. Similar to the survey of Yam (2000), the research showed that people over 25 years old dominated the online consumption group. The older the person, the higher the level of online shopping.



### *Validity and Reliability*

We used content validity to assess questionnaire validity. The questionnaires we developed are according to the suggestions of Ajzen and Fishbein (1980) and with reference of suggestions of Steven, et al., (1999), Gerald, et al., (2000), and Li, et al., (1999), with the modifications described above, so the content validity of the questionnaire should fit demand.

To assess reliability, we used item-to-total correlation and Cronbach's Alpha. In the 12 questions on attitude, the relevant correlation of item-to-total all were greater than 0.5, therefore all were kept. In the 9 questions on subject norm, the sixth question was deleted, and eight questions were reserved. In the 17 questions on perceived behavioral control, insignificant variables including items 1, 2, 3, 4, 13, 15, and 17 were deleted and 10 questions retained. In the 4 questions on behavior intention, the relevant correlation of the item-to-total were all larger than 0.5, therefore all were kept. In the 7 questions on past purchase experience, items 1 and 6 were deleted, with five left. In the 6 questions on channel knowledge, item 6 was deleted, with five left. Also, we used Cronbach's Alpha, with the traditional value of 0.70 as the threshold to demonstrate consistency. All of the scales surpassed 0.70, ranging from 0.84 to 0.93. Therefore, we concluded that this was an adequate level of reliability.

### *Data Analysis*

SPSS was used to run linear regression statistical testing. To test the hypotheses, gender, age, and education were included as controls in all tests. Descriptive statistics were used to understand respondents' reactions to the three variables of the TPB.

## **Results**

### *Demographic Information*

A description of various demographic variables relating to the respondents is shown in Table 1 and Table 2.

### *Correlation*

Descriptive statistics and pearson product moment correlations for variables used in testing the hypotheses are shown in Table 3.

### *Tests of Hypotheses*

We used multi-regression analysis for hypothesis testing. For our first hypothesis, we see from model 2 in Table 4 that it reaches a level of significance ( $\beta=.528$   $p<0.01$ ), which shows that a consumer's attitude will affect his/her shopping behavior. Therefore, Hypothesis 1 is accepted. For the second hypothesis, we see from model 3 in Table 4 that it reaches a significance level ( $\beta=.477$   $p<0.01$ ), which means a consumer's subject norm to online shopping will affect his/her purchase behavior, and therefore Hypothesis 2 is accepted. For Hypothesis 3, we see from model 4 in Table 4 that it reaches a significance level ( $\beta=.165$   $p<0.01$ ), which means a consumer's perceived behavioral control to online shopping will affect his/her purchase behavior,

**Table 1: Demographic Variables**

		N	%			N	%
Data sources	Common questionnaires	334	78.4	Average time online each time	Under 30 minutes	94	22.1
	Internet	92	21.6		31minutes-1 hour	105	24.6
Gender	Male	220	51.6		61 minutes-2 hours	135	31.7
	Female	206	48.4		121 minutes-3 hours	44	10.3
Age	Under 18	16	3.8		181 minutes-4 hours	21	4.9
	19-23	237	55.6		201 minutes-5 hours	10	2.3
	24-28	59	13.8		Above 301 minutes	17	4.0
	29-33	63	14.8	Average online times each week	Below 10 hours	230	54
	34-38	28	6.6		11~20 hours	98	23
	Above 39	23	5.4		21~30 hours	50	11.7
Marital Status	Single	342	80.3		31~40 hours	18	4.2
	Married	84	19.7		Above 41 hours	30	7
Education Background	High school (Professional training)	33	7.7	Consumption amount each time shopping online	Below NT\$500	28	12.6
	Junior college	67	15.7		NT\$501-1000	82	36.8
	University	274	64.3		NT\$1001-2000	94	42.2
	Postgraduate and above	52	12.2		NT\$2001-3000	13	5.8
Profession	Student	187	43.9		NT\$3001-4000	4	1.8
	Commerce	20	4.7		Above NT\$4001	2	0.9
	Industry	42	9.9	Online shopping experience	Yes	223	52.3
	Army/public official/Teaching	57	13.4		No	203	47.7
	IT	3	0.7				
	Freelancer	2	0.5				
	Service	77	18.1				
	Other	38	8.9				

**Table 2: Online Shopping Data**

		N	%		N	%
What kind of products have been purchased on the Internet (more than one option may be selected)	Books	108	16.4	Air flight tickets, train tickets	106	16.1
	Peripherals of computer	50	7.6	Online traveling service	56	8.5
	CD	43	6.5	Flowers and gifts	24	3.6
	Cosmetics	59	9	Online financial management	31	4.7
	Computer software	24	3.6	Clothes	21	3.2
	Telecommunication and Electronic products (mobile phone, PDA....)	21	3.2	Personal collection	16	2.4
	Online game	19	2.9	Food (cakes etc.)	3	.5
	ISP networking services	22	3.3	Others	55	8.4

**Table 3: Correlations and Descriptive Statistics**

Variable	Mean	s.d.	1	2	3	4	5	6
1.Attitude	11.6487	7.32376	(.9079)					
2.Subject Norm	13.3864	7.64750	.470**	(.8875)				
3.Perceived Behavioral Control	7.0056	5.74932	.197**	.239**	(.9213)			
4.Behavior Intention	3.6420	1.69283	.497**	.471**	.175**	(.9346)		
5.Past Shopping Experience	4.6638	1.56264	.362**	.309**	-.139**	.585**	(.8762)	
6.Consumer Channel Knowledge	3.4305	1.15227	.485**	.281**	.167**	.501**	.493**	(.8436)

Note: 1. Correlation is significant at the 0.01 level (2-tailed).

2.  $ATT = \sum E_j * B_j$  (Value from 1 to 49);  $SN = \sum MC_j * NB_j$  (Value from 1 to 49);  $PBC = \sum PF_j * CB_j$  (value from 1 to 49).

therefore Hypothesis 3 is accepted. For Hypothesis 4, we see from model 5 in Table 4 that it reaches significance level ( $\beta = .605$   $p < 0.01$ ), which means a consumer's past online shopping experience will affect his/her purchase behavior, therefore Hypothesis 4 is accepted. For Hypothesis 5, we see from model 6 in Table 4 that it reaches significance level ( $\beta = .506$   $p < 0.01$ ), which means a consumer's Internet channel knowledge will affect his/her shopping behavior, therefore Hypothesis 5 is accepted.

Additionally, from the TPB equation, we find that  $BI = .367 * ATT + .289 * SN + .033 * PBC$ . The Perceived Behavioral Control is not significant, which means the explanation power of this variable in this model still needs improvement. However, from model 9 (with past purchase experience added) and model 10 (with consumer channel knowledge added),  $R^2$  increased from .329 to .515 and .527, which shows that the variables added in this study improve the explanation power for the model. Model 9 and model 10, also indicate that every variable is significant, which means that all hypotheses we formulated are valid. It also proves that the opinions of Steven et al. (1999) and Gerald et al. (2000) that consumer's online shopping experience would affect his/her purchase intention. Similarly, the opinion of Li, et al., (1999) that a consumer's improved channel knowledge, results in greater online shopping intention is also supported in Hypothesis 5 of this study.

### Descriptive Statistics Analysis

For consumer online shopping attitudes, the most important five factors are:

- 1.) Shopping freely without disturbance by others (shop assistant, or passersby) (consistent with Alba, et al., (1997) and Scansaroli and Eng (1997)).
- 2.) Reducing the trouble to go shopping outdoors (traffic, parking, crowds) (consistent with Scansaroli (1997), Li, et al., (1999), and Swaminathan, et al., (1999)).
- 3.) To buy particular or unique products (similar to the research of Alba, et al., (1997), Scansaroli and Eng (1997), Peterson, et al., (1997), and Larcener (1999)).
- 4.) Reducing the time cost on searching product information (consistent with Ainscough and Lockett (1996), Klein (1998), and Scansaroli (1997)).
- 5.) Surfing the products without time pressure (consistent with Alba, et al., (1997) and Scansaroli and Eng (1997)).

**Table 4: Multi-Regression Results of Behavior Intention**

	Model 1	Model2	Model3	Model4	Model5	Model6	Model7	Model8	Model9	Model10
<b>Control variable</b>										
1.Gender	-.030	.122*	-.046	-.009	.008	-.012	.066	.070	.088	.070
2.Age	-.104*	-.002	-.131**	-.086	.002	-.064	-.050	-.046	.041	.029
3.Education	-.021	-.049	.017	.010	.087	.067	-.017	-.011	.111**	.124**
<b>Independent variables</b>										
1.Attitudes		.528**					.369**	.367**	.220**	.166**
2.Subject Norm			.477**				.296**	.289**	.161**	.172**
3.Perceived Behavioral Control				.165**				.033	.205**	.181**
4.Past purchase experience					.605**				.521**	.464**
5.Consumer's Channel Knowledge						.506**				.142**
R <sup>2</sup>	.012	.264	.238	.038	.350	.257	.328	.329	.515	.527
Adj R <sup>2</sup>	.005	.257	.230	.028	.343	.249	.320	.320	.507	.518
F	1.723	37.748**	32.794**	4.101**	56.549**	36.313**	41.050**	34.276**	63.435**	58.144**

\*\* p<0.01 \* p<0.05

For subject norm questions, the most important five influences are: website salesperson, friend, user with experience, classmate, and teacher (consistent with the research of Hansen, et al., (2004)).

For perceived behavioral control questions, the most important five are:

- 1.) Inconvenient product return or exchange, (consistent with MIC, Institute of Information Industry (MOEA, 1997)).
- 2.) Poor product quality.
- 3.) Security of the transaction system (similar to research of Hoffman, Novak & Peralta (1999) and investigation research of MIC, Institute of Information Industry (MOEA, 1997)).
- 4.) Transaction rules are not clear (similar to research of CNET (2001)).
- 5.) Release of private information (consistent with Chen (2000)).

In addition, Table 1 shows that the average time spent shopping online was less than 10 hours per week for most people, consistent with Yam (2003). How to keep net users online longer and increase their motivation to shop would be another interesting topic for future research. The top five products consumers were willing to purchase online were: books, airplane or train tickets, cosmetics, telecommunication and electronic products, and computer software, which is consistent with research of the Institute of Information Industry, which ranked the top four products suitable for online shopping as books/magazines, cosmetics, telecommunication and electronic products, and computer peripherals. This also is consistent with research of the Institute of Information Industry, which showed that men shopped mostly for "3C" products and books, while women most often shopped for cosmetics (Wu, 2004).

**Table 5:** Means, Standard Deviations, and Rank.

Questions for measurement	Mean	s.d.	Rank
<b>ATT</b>			
A1 Cheap in price	12.5540	11.3562	
A2 To serve my curiosity	12.2207	10.3418	
A3 To easily buy private products which dare not be bought in common stores	10.1901	10.8228	
A4 It makes me feel satisfied and a sense of achievement	17.8451	10.8766	
A5 I can quickly obtain what I want	13.6009	10.8548	
A6 Reduce the trouble of going shopping outdoors(traffic, parking, stream of people)	8.3263	9.2898	2
A7 I can surf the commodities without time pressure	9.2958	9.6175	5
A8 Reduce the time cost of searching product information	8.9249	8.7123	4
A9 Freely without disturbance by others (shop assistant, and passerby)	7.0962	7.7470	1
A10 To buy particular or unique commodities	8.8568	9.4985	3
A11 To increase life recreation and entertainment	14.2864	12.0699	
A12 Obtain more emphasis and respect than shopping in traditional stores	16.5869	12.4956	
<b>SN</b>			
S1 Relative	15.2723	9.8160	
S2 Friend	11.7160	8.6150	2
S3 Classmate	12.8568	10.0280	4
S4 Teacher	13.6244	10.7408	5
S5 Family member (parents, brothers and sisters)	14.9624	10.8084	
S7 Website salesperson	11.5493	8.6279	1
S8 Expert in this field	14.7606	12.2390	
S9 User with experience	12.3498	10.4225	3
<b>PBC</b>			
P5 Poor product quality	5.7770	6.3742	2
P6 Release of private information	6.1737	7.6529	5
P7 Price higher than bricks and mortar stores	7.8920	7.4229	
P8 Transaction procedure overcomplicated	7.3685	7.4457	
P9 Transaction rules not clear	6.1244	6.7452	4
P10 Return or change of the products inconvenient	5.7512	6.1807	1
P11 Expense for connecting to Internet is too expensive	10.1103	9.8797	
P12 Inconvenient delivery of products	7.3028	6.9675	
P14 Security of the transaction system	5.9836	7.5173	3
P16 Reliable payment system approach (such as SSL)	7.5728	8.2838	

Our research showed that online shoppers still focus on low cost products below NT\$2000, and don't enter into large denomination purchases. This may be because of internal worries or external barriers (such as transaction system security or poor product quality). Therefore, it appears consumers tend to choose simple products with a low price. It appears that in order to encourage consumers to purchase more expensive products, Internet retailers should emphasize their products' unique qualities, make the purchase process easy, and emphasize system security.

### Conclusion and Suggestions

The results of the study demonstrate that the TPB is applicable to the measurement of behavioral intentions in online shopping. This study provides empirical support for the adequateness of Ajzen's TPB model in online shopping behavior.

The findings in this study also demonstrate that past experience and channel

knowledge exert significant influence on online shopping behavior. Together with the three variables of the TPB, past experience and channel knowledge can also enhance the predictive utility of the TPB for the intention of engaging in online shopping behavior. Therefore, the addition of past experience and channel knowledge to the TPB model improve the prediction of online shopping behavior.

Some limitations of the study may have biased the conclusions drawn from the findings. First, this study did not classify products or services, and might not be completely accurate or extensive. Darby and Karni (1973) classified consumer's cognition to product quality into three groups: search goods, experience goods and trust goods. Research of Alba, et al., (1997) also suggested that search goods and trust goods were suitable for Internet marketing, while experienced goods were suitable for retailing stores. Kiang, Raghu, and Shang (2000) also classified products suitable for sales via the Internet, concluding that digitalized information and services were most suitable. Therefore, future research might cover the classification and characteristics of products/services, and how they affect online shopping behavior.

Second, subjects in the study were on-the-job students and Internet users, and while some were part-time, the final sample in the study still had about 43.9% full-time students. Therefore, the results may be limited or biased. A larger, more heterogeneous group of consumers should be studied to improve the applicability of the results to the larger population.

For Internet retailers, the study found that there were still many areas that needed improvement (except requirement on quality). For example, the website content should be more diversified, unique, interesting and substantial, so that individuals are more willing to spend time online. A website should make the purchase procedure simple, or clearly demonstrate it to insure consumers understand the entire process (including return or exchange procedures and time), step by step. Transaction system security and consumer data confidentiality still affect consumers' willingness to shop online. Safer transaction systems (such as SLL, Secure Socket Layer Protocol) or providing compensation should data be released in error, might improve customer trust in online shopping.

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