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July 2008

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Recommended Citation

Chen, Yinh-Hueih; Tsao, Ching-Yi; Lin, Chia-Chen; and Hsu, I-Chieh, "A CONJOINT STUDY OF THE RELATIONSHIP BETWEEN WEBSITE ATTRIBUTES AND CONSUMER PURCHASE INTENTIONS" (2008). *PACIS 2008 Proceedings*. 224.
<http://aisel.aisnet.org/pacis2008/224>

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A CONJOINT STUDY OF THE RELATIONSHIP BETWEEN WEBSITE ATTRIBUTES AND CONSUMER PURCHASE INTENTIONS

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Abstract

Many scholars have developed different conceptual models to capture effects of factors on consumers' preferences for on-line shopping websites (e.g., Ranganathan and Gananpathy, 2002; Schaupp and Belanger, 2005; Shih, 2004; Straub and Watson, 2001) because the on-line shopping website has become one of the major interfaces between companies and their consumers. A review of extant literatures suggests that a survey method has been widely used. However, a survey method used for exploring consumers' preferences for on-line shopping websites may bear potential problems of validity and transferability due to respondents' potential lack of both the knowledge and experience associated with on-line technologies.

To address the above problem, a refined methodology is imperative in the investigation into on-line shopping experiences. In this paper, we extended and modified the Schaupp and Belanger model (2005) to develop and propose a model of on-line shopping intentions that includes three categories of factors: technology, shopping, and product. Next, we developed four on-line websites that incorporate and operationalize the relevant factors to serve as test platforms. All respondents of this study were asked to visit these web-sites that represent differing shopping scenarios before they completed our on-line survey. By simulating different shopping scenarios on our four test platforms, prior experiences of respondents are not required in this study.

Findings of this study are as follows. First, on-line contract signing mechanism was ranked as the most desired option in building trust in on-line shopping websites by all respondents. Second, respondents of this study were found able to be categorized into three groups according to the website factors they valued most. The three were logistic/security, security/trust, and convenience/trust. The specific attributes of on-line shopping websites valued most within each of the three groups are discussed in this paper. This study presents findings that support the use of many existing on-line technologies that have been found little used in on-line shopping websites such as digital certificate and on-line contracting. The inclusion of these technologies in on-line shopping websites may increase the cost of building and maintaining them and may create worries about user inconvenience. However, it is important that these technologies increase the attractiveness of the on-line shopping website and web surfers purchase intentions.

Keywords: On-line customer satisfactions, Conjoint analysis, Prototyping systems, E-commerce metrics.

1 INTRODUCTION

Since the B2C on-line shopping website has become one of the major interfaces between companies and their consumers, it becomes a critical issue to make sure consumers are satisfied with their on-line shopping experiences. Many scholars have developed different conceptual models to capture effects of factors on consumers' preferences (e.g., Ranganathan and Gananpathy, 2002; Schaupp and Belanger, 2005; Shih, 2004; Straub and Watson, 2001). A review of extant literatures suggests that a survey method has been widely used. However, wide acceptance does not necessarily signify high reference values of research outcomes. A survey method bears potential problems of validity and transferability.

As on-line technologies and applications are advancing fast, respondents that possess the necessary knowledge and experiences for a survey are getting more and more important on one hand. The odds that finding and targeting such respondents are getting more and more difficult. Validity has become a challenge. Furthermore, as on-line technologies are advancing, companies using them for expansions face both attracting new on-line customers as well as keeping existing customers. Research findings from existing customers may not be able to be transferred to potential customers who may lack both the knowledge and experience. Companies may need differing strategies in attracting new customers, whose intentions of shopping on-line should be increased, while keeping existing ones, whose satisfaction of on-line shopping should be increased. Thus, a refined methodology is imperative in the investigation of on-line shopping experiences. In this paper, we develop and propose a model of on-line shopping experience. To investigate how each of the factors included in the model affects on-line shopping experience, four on-line websites that incorporate and operationalize the relevant factors were established to serve as test platforms. We asked our respondents to go to these web-sites that represent differing shopping scenarios. Prior experiences are not necessary in this study. Findings of this study can have implications for company decision-making.

2 CONCEPTUAL MODEL

The purpose of this research is to identify and assess the impacts of website features on on-line shopping experiences. As mentioned earlier, this issue has been investigated in existing literatures. In 2005, Schaupp and Belanger (2005) proposed a conceptual model of consumers' satisfactions on one-line shopping website that includes three categories of factors: technology, shopping and product. Each category consists of three attributes. Take technology category as an example. Security, privacy, usability and site design are included. Because Schaupp and Belanger asked their respondents to evaluate all three categories of factors jointly, the relative importance of the effects of the three categories of factors on consumer satisfaction can be revealed. Through a comprehensive literature review, we extended and modified the Schaupp and Belanger model (2005) to develop and propose a model of on-line shopping intentions that includes three categories of factors: technology, shopping, and product. The impacts of the three categories of factors are also investigated in this paper. The factors are discussed below.

2.1 Technology Factors

The technology factors entail the quality of the web-site that facilitates online transaction. This research followed Schaupp and Belanger (2005) and considered security, privacy, and usability to be key features of the web-site quality.

Security. Information security is one of the frequently cited concerns in e-commerce. B2C vendors have developed a number of mechanisms to enhance information security. Advanced security mechanisms, like cryptography and authentication, are common approaches for the protection of private and transaction information. Digital certificate technologies, such as eCard and Smartcard, are

also employed to secure the on-line information exchange. A personal account with an ID and password is offered to alleviate transaction concerns (Ranganathan and Ganapathy, 2002). Observing the varied security mechanisms, we evaluate the features of security from four aspects: (1) the website provides information encryption for data transmission (Schaupp and Belanger, 2005; Ranganathan and Ganapathy, 2002), (2) the website requires the user to set up an account with an ID and password ((Schaupp and Belanger, 2005; Ranganathan and Ganapathy, 2002), (3) a confirmation screen is displayed after the completion of the transaction (Schaupp and Belanger, 2005; Ranganathan and Ganapathy, 2002), and (4) the website offers digital certificates to protect private and transaction data.

Privacy. Privacy is often regarded as the ability of an individual to control, manage, and selectively reveal personal information. To eliminate the privacy concern, most web-based vendors develop privacy policies to protect individual privacy. In this research, we evaluate the privacy attributes by three features: (1) a privacy statement presented by the vendor (Schaupp and Belanger, 2005; Ranganathan and Ganapathy, 2002), (2) the request of customer consent to private information sharing or distribution (Schaupp and Belanger, 2005; Ranganathan and Ganapathy, 2002), and (3) the request of customer consent to the use of cookies (Schaupp and Belanger, 2005; Ranganathan and Ganapathy, 2002).

Usability. Website usability refers to the overall website design and functionalities. This research summarized the previous findings and evaluated the website usability from three key features: (1) the website provides user-friendly interface and are easy to use (Schaupp and Belanger, 2005), (2) the website possesses fast and accurate searching capability (Schaupp and Belanger, 2005), and (3) the website provides rich contents and interactive mechanisms (Schaupp and Belanger, 2005).

2.2 Shopping Factors

Shopping factors refer to individual and website attributes that are related to shopping experience (Schaupp and Belanger, 2005). Schaupp and Belanger (2005) scrutinized the shopping process and proposed that convenience, trust, and delivery are three major attributes that affect shopping experience. This research adopted these three attributes but modified the key features of each attributes to better reflect the e-commerce practice.

Convenience. While previous studies capture major design and operational mechanisms to ease the effort of online shopping, they do not consider online services that may also support online transaction. On observing the consumer's need for product return/exchange and his/her preference for information sharing, this study extends the scope of convenience to incorporate five major features: (1) products are categorized to the ease of shopping (Schaupp and Belanger, 2005; Ranganathan and Ganapathy, 2002), (2) vendors provide various payment methods (for example, credit card, wire-transfer, online money transfer ... etc.) (Chen, 2006), (3) consumers are able to look up detailed product information and to make price comparison (Schaupp and Belanger, 2005; Ranganathan and Ganapathy, 2002), (4) vendors provide customer service in terms of product exchange and return, and (5) vendors provide online forums that enable the consumers to share information.

Trust. Trust has been recognized as a necessary condition for relationship development. Past research has investigated trust characteristics and trust development processes. Mayer *et al.* (1995), for example, proposed that trust can be assessed from ability, benevolence, and integrity. Turban *et al.* (2006) argued that secured IT infrastructure is fundamental to decrease perceived risk and increase consumer trust in the context of e-commerce and online transaction. Schaupp and Belanger (2005) suggested that the ability of merchant to handle sales transaction and conduct e-commerce professionally may enhance consumer belief regarding vendor ability and integrity. In our study, the features evaluated within the attribute of trust include: (1) the Internet vendors use certified transaction platform (Yoon, 2002), (2) when the consumer encounters transaction problems, the vendors provide spontaneous explanation and online assistance, (3) the Internet vendors provide detailed transaction contracts to specify the rights and responsibilities of trading entities.

Delivery. Delivery refers to the total time spent over shipping and handling. Schaupp and Belanger (2005) pointed out that reliable and timely product delivery is essential to e-satisfaction. Based on this argument, Schaupp *et al.* (2005) argued that vendors should endeavor to not only minimize delivery time but also provide parcel tracking mechanisms to reduce consumer anxiety. While these suggestions capture major delivery practices, they do not fully reflect the common logistic service provided in Taiwan as the context of this research. Because Taiwan is a small island with high population density and wide-spreading convenient stores, Taiwanese vendors often allow consumers to pick up products in a local convenience store. In addition, the tracking number service is not applicable in Taiwan, where one-day delivery is a common practice. Thus, we modified the Schaupp and Belanger (2005) measurement items and evaluated the features of delivery time in terms of: (1) the overall minimization of delivery time (Schaupp and Belanger, 2005), (2) the awareness of any potential delays in shipping (Schaupp and Belanger, 2005), (3) the vendor's notification when shipping is delayed, and (4) the consumer ease of product pick-up at a local convenient store.

2.3 Product Factors

Schaupp and Belanger (2005) considered product factors to be the perceived quality of the product or service for sale. They argued that merchandising, quality of products, and customization are major determinants of the customer's purchase decision. This study eliminates customization because it tends to increase the production cost and transaction complexity. As such, this study captures the product factors in terms of product value and merchandising.

Product Value. Product value is defined as a factor associated with customer perceived product and service quality. Synthesizing previous research, this study evaluated the features of product value from: (1) product features matching customer expectation, (2) product with ease of use, (3) product pricing reasonably reflecting product brand, and (4) vendors offering continuous customer service.

Merchandising. Szymanski and Hise (2000, p. 312) defined merchandising as "factors associated with selling offerings online separate from site design and shopping convenience". Schaupp and Belanger (2005) suggested that e-commerce should provide breadth and depth of product offers to impress the consumer. This research follows Schaupp and Belanger (2005) and evaluates the features of merchandising in terms of: (1) offering extensive product assortment and variety, (2) offering exclusive products, and (3) offering seasonal products and sales.

Table 1 summarizes the conceptual variables, measurement attributes, and levels of each attribute. Consumers engaging in online transaction often take into account various factors and the need to make trade-off decision to maximize individual satisfaction.

Table 1. Summary of research variables

Category	Attributes	Levels	References
Technology	Security	Information encryption	Schaupp et al. (2005); Ganapathy et al. (2002)
		Accounts with ID and password	Schaupp et al. (2005); Ganapathy et al. (2002)
		Confirmation screen	Schaupp et al. (2005); Ganapathy et al. (2002)
		Digital certificate	Proposed by this study*
	Privacy	Privacy statement	Schaupp et al. (2005); Ganapathy et al. (2002)
		Policy on information distribution	Schaupp et al. (2005); Ganapathy et al. (2002); Chen (2006)
		Use of cookies	Schaupp et al. (2005); Ganapathy et al. (2002)
Usability	User-friendly interface	Schaupp et al. (2005); Ganapathy et al. (2002); Szymanski et al.	

			(2000)
		Adequate search capability	Schaupp et al. (2005); Szymanski et al. (2000)
		Interactive website	Schaupp et al. (2005); Chen (2006)
Shopping	Convenience	Products are categorized to ease of shopping	Schaupp et al. (2005); Ganapathy et al. (2002)
		Varied payment methods	Chen (2006)
		Price/product comparison	Schaupp et al. (2005); Liang et al. (2001)
		Product return and exchange service	Proposed by this study*
		Vendors provide online forum for customers to share information	
	Trust	The certified transaction platform	Yoon (2002)
		When customers encounter problems, vendors provide spontaneous explanation and assistance.	Proposed by this study*
		The Internet vendors provide detailed transaction contract to specify the rights and responsibilities of trading entities.	
	Delivery	Minimization of delivery time	Schaupp et al. (2005)
		Awareness of potential delay	Schaupp et al. (2005)
		The vendor contacts the consumer when shipping is delayed	Schaupp et al. (2005)
		The consumer can pick up products from a local convenient store	Proposed by this study*
Product	Product value	Product features match customer expectation	Brucks et al. (2000)
		Ease of use	Brucks et al. (2000)
		Product price reflects product brand reasonably	Turban et al. (2006); Schaupp et al. (2005)
		Continuous customer service	Brucks et al. (2000)
	Merchandising	Extensive assortment	Szymanski et al. (2000) Schaupp et al. (2005)
		Exclusive products	Schaupp et al. (2005)
		Seasonal products and sales	Schaupp et al. (2005)

3 RESEARCH METHOD AND RESULTS

Conjoint analysis is one of the multivariate techniques that have been widely applied to investigate consumer preferences. Conjoint analysis is a decompositional approach in which consumer structure of preferences is estimated through overall evaluation of a set of profile descriptions. This study employed conjoint analysis to grasp the relative preference level of each attribute and their corresponding experienced levels. This study took six sequential steps: preference model, data collection, defining subsets of stimuli, stimulus presentation, measurement scale for the dependent variable and estimation method, for data collection and analysis.

3.1 Research Sample

We drew our research samples from a population of 20,000 students enrolled in a university in Taiwan. In order for these samples to effectively stand for the overall research population, we employed a stratified sampling method to identify 76 classes with 4144 students to participate in the research. This research conducted two stages of data collection. In the first stage, the samples were

asked to participate on an online survey. In the sequel, the collected data were analyzed to identify influential attributes and levels of each attribute leading to online purchase intentions. Table 2 summarizes the respondent profile.

Table 2 Respondent profile (stage I)

Grade College	Freshman	Sophomore	Junior	Senior	Total
Humanities and Social Sciences	40	59	49	73	221
Foreign Languages and Literature	35	47	20	27	129
Science	39	49	54	64	206
Computing and Informatics	27	33	56	43	159
Management	141	62	74	62	339
Total	282	250	253	269	1054

Based on initial feedback, this research further modified the measurement scales to better reflect the consumer's preference structures. The merchandising attribute and associated levels are eliminated because of low attribute scores. The second stage of data collection was then conducted to elicit the major attributes influencing the consumer's online purchasing intentions. To eliminate potential problems that may arise from respondents lack of familiarity with newly developed security and privacy functions, four test platforms are developed by PHP to simulate various security and privacy functions, which have been provided and have chances of being provided in the future on B2C on-line shopping websites. All respondents were asked to simulate on-line shopping on our four test platforms before they fill in one-line questionnaires. The combinations of security and privacy functions for the four test platforms are presented in Table 3.

Table 3 Combinations of security and privacy functions for four test platforms

Four test platforms	Levels of Security	Levels of Privacy
Shop1	Information encryption	Privacy statement
Shop2	Accounts with ID and password	Policy on information distribution
Shop3	Confirmation screen	Use of cookies
Shop4	Digital certificate	None

The second stage of data collection, respondents included 71.73% females and 28.27% males. Among the respondents, 62.38% had taken e-commerce related courses before, 58.48% had more than seven years of computer experiences, 0.39% had less than one year computer experiences, 48.34% used Internet more than 14 hours per week, and over 57% had at least three times of online shopping experiences. Table 4 summarizes the respondent profile.

Table 4 Respondent profile (stage II)

Grade College	Freshman	Sophomore	Junior	Senior	Total
Humanities and social Sciences	39	21	20	36	116
Foreign Languages and Literature	21	15	12	21	69
Science	21	22	19	25	87
Computing and Informatics	12	20	44	19	95
Management	44	39	25	38	146
Total	137	117	120	139	513

3.2 Statistical Analysis of Bias and Respondent Different

Because of the separation of data collection into two stages in our study, it is necessary to examine the data differences. We performed the Chi-square test (χ^2) to test whether multiple groups of observed

frequencies differ significantly across differing colleges and across differing grades. Tables 5 and 6 summarize our statistical analysis. The results failed to reject the null hypothesis. That is, no significant difference was detected in the first and second sets of data.

Table 5 Statistical analysis of college distribution of first vs. second sets of data

College	Stage I		Stage II	
	Sample Size	Percentage	Sample Size	Percentage
Humanities and Social Sciences	221	20.97%	116	22.61%
Foreign Languages and Literature	129	12.24%	69	13.45%
Science	206	19.54%	87	16.96%
Computing and Informatics	159	15.09%	95	18.52%
Management	339	32.16%	146	28.46%
$\chi^2 : 9.226$, P-value : 0.0557				

Table 6 Statistical analysis of grade distribution of first vs. second sets of data

Grade	Stage I		Stage II	
	Sample Size	Percentage	Sample Size	Percentage
Freshman	282	26.76%	137	26.71%
Sophomore	250	23.72%	117	22.81%
Junior	253	24.00%	120	23.39%
Senior	269	25.52%	139	27.10%
$\chi^2 : 0.7582$, P-value: 0.8594				

Results. One of the major characteristics of conjoint analysis is that it enables the researcher to generate a separate model for groups of individuals representing different market segments. This research only adopted componential segmentation because componential segmentation emphasizes the interaction of the stimulus profile with a person profile and explores how a respondent responds to a set of stimuli. The K-means method is applied for discriminate analysis. Three groups are identified to reflect diverse consumer characteristics.

In order to identify respondent characteristics and to examine sample differences, this research conducted Chi-square tests alongside the following dimensions: e-commerce training, the history of online surfing, accumulated web-surfing time per week, the number of times in visiting commercial websites in the previous year, online shopping experience, the number of times in online shopping in the previous year, average online-shopping in the previous year, the degree of concern for website security, and concern for website security by dollar values. Table 7 summarizes the results of our Chi-square test.

Table 7 Results of Chi-square tests

Descriptive variable	Componential Segmentation	
	χ^2	P-value
E-commerce training	1.838	0.399
History of online surfing	6.152	0.406
Accumulated web-surfing time per week	6.152	0.406
Number of times in visiting commercial websites in the previous year	6.469	0.373
Online shopping experience	2.540	0.281
Number of times in online shopping in the previous year	22.552	0.004*
Average online-shopping in the previous year	14.686	0.137
Degree of concern for website security	34.710	0.000*
Concern for website security by dollar values	46.630	0.000*

3.3 Componential Segmentation

Data characteristics. Three individual groups are identified from K-means analysis. The Chi-square tests indicated significant data differences in the number of times in online shopping, the degree of concern for website security, and concern for website security by dollar values. A contingency table is generated to identify the major difference. In terms of the number of times in online shopping, the first group revealed relatively rich online experiences but low security concern. Besides, group two and group three revealed security concern on online shopping. Table 8 summarizes the Chi-square test results.

Table 8 Results of chi-square test for componential segmentation

		Componential Segmentation			Total
		Group I	Group II	Group III	
Number of times in online shopping in the last year ($\chi^2=22.552$, degree of freedom =8 , P-value=0.004)					
No shopping experience	Count	17	42	42	101
	Frequency	14.78%	20.10%	22.22%	19.69%
1-2 times	Count	21	45	53	119
	Frequency	18.26%	21.53%	28.04%	23.20%
3-6 times	Count	37	77	62	176
	Frequency	32.17%	36.84%	32.80%	34.31%
7-13 times	Count	20	30	24	74
	Frequency	17.39%	14.35%	12.70%	14.42%
Above 14 times	Count	20	15	8	43
	Frequency	17.39%	7.18%	4.23%	8.38%
total	Count	115	209	189	513
	Frequency	100%	100%	100%	100%
Concern for website security ($\chi^2=34.710$, degree of freedom= 2 , P-value=0.000)					
Low concern for online security	Count	49	39	28	116
	Frequency	42.61%	18.66%	14.81%	22.61%
High concern for online security	Count	66	170	161	397
	Frequency	57.39%	81.34%	85.19%	77.39%
Total	Count	115	209	189	513
	Frequency	100%	100%	100%	100%
Concern for website security by dollar values ($\chi^2=46.630$, degree of freedom =12 , P-value=0.000)					
Website security is not important	Count	49	39	28	116
	Frequency	42.61%	18.66%	14.81%	22.61%
0-\$500	Count	11	34	34	79
	Frequency	9.57%	16.27%	17.99%	15.40%
\$ 501-1000	Count	10	44	39	93
	Frequency	8.70%	21.05%	20.63%	18.13%
\$1001 - 2000	Count	30	45	57	132
	Frequency	26.09%	21.53%	30.16%	25.73%
\$2001 - 3000	Count	6	24	19	49
	Frequency	5.22%	11.48%	10.05%	9.55%
\$3001 – 5000	Count	4	11	7	22
	Frequency	3.48%	5.26%	3.70%	4.29%
More than 5000	Count	5	12	5	22
	Frequency	4.35%	5.74%	2.65%	4.29%
Total	Count	115	209	189	513
	Frequency	100	100	100	100

Outcome. The part-worth analysis indicated that group 1 revealed preferences on attributes of logistic, security, and privacy (Table 9). Convenience and speed of product delivery are the most important attributes as compared to the others. In particular, this group of people prefers the pick-up service of convenient stores. In addition, an account with ID and password is also found to be the most important feature among the attributes of security. A Website privacy policy on information distribution will add to the site attractiveness. Based on the preference characteristics of this group, this study labeled group 1 as the logistic/security orientation group. It is suggested that website vendors may pay more attention to logistics design, website security, and privacy issues to enhance the consumer's purchase intentions.

Table 9 Logistic/security orientation group (group 1): part-worth of key attributes

Attributes	Levels of each attribute	Part-worth value	Range of part-worth value	Relative importance	Overall rank
Security	Information encryption	0.179	0.275	17.93%	2
	accounts with ID and password	0.275			
	Confirmation screen	0.184			
	Digital certificate	0			
Privacy	Privacy statement	0.182	0.224	14.60%	3
	Policy on information distribution	0.224			
	Use of cookies	0			
Usability	User-friendly interface	0.170	0.17	11.08%	7
	Adequate search capability	-0.146			
	Interactive website	0			
Convenience	Products are categorized to ease of shopping	-0.185	0.185	12.06%	5
	Varied payment methods	-0.047			
	Price/product comparison	-0.061			
	Product return and exchange service	-0.046			
	Vendors provide online forum for customers to share information	0			
Trust	The certified transaction platform	-0.023	0.209	13.62%	4
	When customers encounter problems, vendors provide spontaneous explanation and assistance	-0.209			
	The Internet vendors provide detailed transaction contract to specify the rights and responsibilities of trading entities.	0			
Logistic	Minimization of delivery time.	-0.199	0.292	19.04%	1
	Awareness of potential delay	-0.292			
	The vendor contacts consumer when shipping is delayed	-0.222			
	The consumer can pick up products from local convenience store.	0			
Product value	Product features match customer expectations.	-0.179	0.179	11.67%	6
	Ease of use	0.003			
	Product price reflects product brand reasonably	0.018			
	Continuous customer service	0			
F-test: 2.877 Regression degree of freedom: 20 Residual degree of freedom: 439 P-value: 0.0001 R-Square: 0.116 Adjusted R-Square: 0.076					

The part-worth analysis indicated that group 2 revealed preferences on attributes of security, trust, and product value (Table 10). This group of people considered information encryption and confirmation screen as important features of website security. Convenience and speed of product delivery are the most important attributes compared to the other attributes. In addition, this group of people would like

website vendors to provide a detailed transaction contract that specifies the rights and responsibilities of the parties involved in the transaction. Product values tend to be measured by continuous customer service, product features, product price, and ease of use. Based on the preference characteristics of the group, this study labeled group 2 to be security/trust orientated. It is suggested that website vendors may pay more attention to enhancing website security, developing customer trust, and enriching product values such that the consumer's purchase intentions are motivated.

Table 10 Security/trust orientation group (group 2): part-worth of key attributes

Attributes	Levels of each attribute	Part-worth value	Range of part-worth value	Relative importance	Overall rank
Security	Information encryption	0.313	0.313	25.61%	1
	accounts with ID and password	0.139			
	Confirmation screen	0.185			
	Digital certificate	0			
Privacy	Privacy statement	-0.038	0.038	3.11%	7
	Policy on information distribution	0.032			
	Use of cookies	0			
Usability	User-friendly interface	0.075	0.075	6.14%	6
	Adequate search capability	-0.028			
	Interactive website	0			
Convenience	Products are categorized to ease of shopping	0.023	0.153	12.52%	4
	Varied payment methods	-0.075			
	Price/product comparison	0.017			
	Product return and exchange service	0.153			
	Vendors provide online forum for customers to share information	0			
Trust	The certified transaction platform	-0.275	0.275	22.50%	2
	When customers encounter problems, vendors provide spontaneous explanation and assistance	-0.190			
	The Internet vendors provide detailed transaction contract to specify the rights and responsibilities of trading entities.	0			
Logistic	Minimization of delivery time.	0.009	0.144	11.78%	5
	Awareness of potential delay	-0.144			
	The vendor contacts consumer when shipping is delayed	-0.014			
	The consumer can pick up products from local convenience store.	0			
Product value	Product features match customer expectations.	-0.052	0.224	18.33%	3
	Ease of use	-0.224			
	Product price reflects product brand reasonably	-0.183			
	Continuous customer service	0			
F-test: 2.479 Regression degree of freedom: 20 Residual degree of freedom: 815 P-value: 0.0001 R-Square: 0.057 Adjusted R-Square: 0.034					

The part-worth analysis indicated that group 3 prefers attributes of convenience, trust, and usability (Table 11). This group of people places more weight on trading, payment, and ease of shopping. Similar to the security/trust orientated group, people in group 3 focus on if website vendors provide detailed transaction contracts to specify the rights and responsibilities of the trading parties. It is interesting to find that this group of people considers website usability an important feature that may influence their purchasing decision. This group of people tends to shop on those websites that provides search functions and friendly user interfaces. Based on the preference characteristics of this group, this

study labeled Group 3 as a convenience/trust orientated group. It is suggested that website vendors should pay more attention to website design to enhance shopping convenience and website usability.

Table 11 Convenience/trust orientation group (group 3): part-worth of key attributes

Attributes	Levels of each attribute	Part-worth value	Range of part-worth value	Relative importance	Overall rank
Security	Information encryption	-0.014	0.095	6.85%	7
	Accounts with ID and password	0.002			
	Confirmation screen	-0.095			
	Digital certificate	0			
Privacy	Privacy statement	0.097	0.097	6.99%	6
	Policy on information distribution	0.053			
	Use of cookies	0			
Usability	User-friendly interface	0.171	0.283	20.40%	3
	Adequate search capability	0.283			
	Interactive website	0			
Convenience	Products are categorized to ease of shopping	0.095	0.344	24.80%	1
	Varied payment methods	0.163			
	Price/product comparison	0.027			
	Product return and exchange service	0.344			
	Vendors provide online forum for customers to share information	0			
Trust	The certified transaction platform	-0.147	0.309	22.28%	2
	When customers encounter problems, vendors provide spontaneous explanation and assistance	-0.309			
	The Internet vendors provide detailed transaction contract to specify the rights and responsibilities of trading entities.	0			
Logistic	Minimization of delivery time.	-0.051	0.159	11.46%	4
	Awareness of potential delay	0.159			
	The vendor contacts consumer when shipping is delayed	0.056			
	The consumer can pick up products from local convenience store.	0			
Product value	Product features match customer expectations.	-0.060	0.1	7.21%	5
	Ease of use	-0.100			
	Product price reflects product brand reasonably	-0.029			
	Continuous customer service	0			
F-test: 2567 Regression degree of freedom: 20 Residual degree of freedom: 735 P-value: 0.0001 R-Square: 0.065 Adjusted R-Square: 0.040					

4 DISCUSSIONS AND CONCLUSIONS

Based on the three groups that emerged from this study, namely, the logistic/security orientation group, the security/trust orientation group and the convenience/trust orientation group, we can find that the preference structures of these groups differ significantly from each other. The logistic/security orientated group emphasized the importance of Internet security, while the other two groups showed either moderate or low concern for this attribute. The security/trust orientated group places more weight on website usability and shopping convenience compared with the other two groups. On the basis of an overall evaluation, because all the groups showed preferences for website security, trust, and logistics, web vendors should emphasize these attributes to satisfy the consumer preference.

Although results of our study may have shown certain elements of “deja vu”, that is, similarity with those of prior studies, this study still offers important insights associated with on-line shopping websites. First, in the issue of trust, all respondents ranked “the Internet vendors provide detailed transaction contract to specify the rights and responsibilities of trading parties” as the first priority regardless of the groups the respondents were located in. So far, on-line contracting whereby the rights and obligations of trading parties are stated participates has not been seen on on-line shopping web-sites even though the current information technology can support such a function. Based on our results, we can see that “the certified transaction platform” and “when customers encounter problems, vendors provide spontaneous explanation and assistance” no longer satisfy customers. Customers need on-line contract signing mechanisms to make sure their rights will not be violated. Second, the convenience/trust orientation group ranked “accounts with ID and password” and “digital certificate” as the first and second desired security functions, respectively. It implicates that customers with an emphasis on trust in the e-commerce environment are willing to use technologies such as digital certificate to protect their on-line transactions. The use of protective functions may signify that customers go through a complex procedure that may include the use of a card reader, and may create worries about customer inconvenience. However, our study suggests that customers wish to trade convenience for security. In conclusion, strong security infrastructure on on-line shopping websites is required to enhance on-line purchase intentions of customers. Such infrastructure should include on-line contracting and digital certificate. This study has offered a list of recommendations e-vendors should consider adopting to attract new customers and their on-line purchase intentions.

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