

Shopping Online or Not? Cognition and Personality Matters

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Abstract

E-commerce has brought both opportunities and challenges to Internet marketers. One challenge facing the marketers is to “convert” Internet users who are reluctant to buy things online to real online shoppers. To enlarge online customer base, it is necessary for researchers and practitioners to understand cognitive and psychological factors involved in a potential online buyer's decision-making process. Drawing upon consumer innovativeness and technology acceptance research, we developed a conceptual model about how cognition and personality would affect an individual's attitude toward online shopping and hence his or her purchasing intention. Our findings show that what an individual thinks and feels about online shopping do influence his or her purchasing intention. The individuals who were more risk-taking, open to new experience, and had higher level of self-efficacy appeared to be more prone to buying online. These findings call for further research on consumer psychology in the context of online shopping.

Key words: e-commerce, consumer innovativeness, technology acceptance, purchasing decision

1 Introduction

Electronic commerce has been shaking the root of business conventions. Almost every firm that has launched online business or plans to do so is eager to know how to get in touch with as more online buyers as possible. Not every Internet user would buy things on the Internet, so an online seller would want to know one thing: Who will buy its products / services? Many Internet marketers tackled this issue by formulating marketing strategies based on online consumers' demographic profiles. However, some recent trends and issues with respect to Internet usage and e-commerce call for attention beyond demography-based marketing strategies. The rate of Internet penetration has been steadily increasing over the past few years [40]. The profile of online shoppers, which used to be skewed in certain demographic characteristics, has become closer to the general population of consumers [57, 71]. Even within the same demographic group, it has been found that psychological attributes such as confidence in one's ability to use the Internet distinguish online shoppers from non-shoppers [41]. It is also noted that Internet users may not really buy things online [26, 27]. One possible reason is that many potential consumers still see online shopping as risky and unsafe [34]. So a practical issue facing online sellers who intend to attract not only "viewers" but also "real buyers" is to identify the customers who are willing to, so to speak, take the "risk" of online shopping.

An implication of these findings is that online sellers need to understand both observable demographic characteristics and cognitive / psychological attributes of their customers. However, the previous research has largely been ambiguous about what drive consumers to shop online [54]. Specifically, the following questions have not yet been clearly answered: What cognitive and psychological processes are involved in an online consumer's purchasing decision? What types of individual difference variables can be used to describe consumers who are more likely to shop online? What benefits can an online seller earn from the understanding of the customers' internal characteristics? In this paper we addressed these questions by proposing a model about the relationships among potential online consumers' internal characteristics, attitude towards online shopping, and their purchasing intention. Drawing upon consumer innovativeness research in marketing literature and technology acceptance research in management information systems (MIS) literature, we suggest that online shopping involves novel shopping experience and the use of advanced information technology. Presently online shopping represents an innovative shopping mode. As mentioned above, people are different in their responses to e-commerce; thus it is interesting to know why some consumers are more likely to *adopt* online shopping mode than others. Both marketing and MIS literature would shed light on this type of study.

2 Theoretical Background

Typically, a virtual store has advantages over a brick-and-mortar store in its ability to offer consumers more choices of products / services, satisfy customers' specific needs, reduce search costs, and provide more convenient delivery and payment arrangements. The question is who would be the early adopters of this brand-new shopping experience. Similar questions have been asked by marketers and researchers in other contexts related to new product / service promotion. In particular, marketing researchers have proposed the concept of *consumer innovativeness* to explain why some individuals are more likely to buy new products and services [32]. However, scholars defined the concept in different ways and provided various explanations about the cognitive and psychological processes involved in an innovative buyer's decision-making. Foxall and colleagues [31] identified two separate and distinctive approaches in consumer innovativeness research: the *personality-based* approach that emphasizes "the almost automatic predisposition of some individual to favor newness, to evince a relentless drive, external circumstances permitting, toward its acquisition," and the *cognitive* approach that emphasizes "the highly-involving nature of new product purchasing and the extended problem-solving sequence likely to precede choice" [31:35].

Our research model has its intellectual roots in three conceptualizations of consumer innovativeness [29, 36, 51]. The first line of thinking was found in Midgley and Dowling's work [51-53]. These authors argued that consumer innovativeness could be an *innate*, trait-like attribute that can be observed in all individuals to different degrees. Innate innovativeness operates invariantly across all the product categories. Hirschman [36, 37] provided another explanation. Her conceptualization of innovativeness was more focused on a consumer's information-seeking behavior. She used the term *novelty seeking* to capture the motivating force that drives an individual to seek out new and different information. Note that different from Midgley and Dowling, who interpreted innate innovativeness as a personality trait, Hirschman emphasized the nature of novelty seeking as a calculated and purposeful cognitive process. Foxall and colleagues' empirical work represented the third stream of research on consumer innovativeness [28, 29]. They suggested that cognitive style be the key individual attribute that distinguishes innovative consumers from noninnovative consumers. Cognitive style is "an individual's manner of processing information mentally in decision making and problem solving" [30: 185].

Taken together, we may say that the concept of innate innovativeness is more about *heart* (affection) whereas the concept of cognitive style is more about *mind* (cognition). The concept of novelty seeking lies somehow in between for it taps both affective (desire for newness) and cognitive aspect (information searching and using). We suggest that an integrative conceptualization of consumer innovativeness should include both affective and cognitive aspects. Moreover, Midgley and Dowling [51] theorized consumer innovativeness as a construct of high level of abstraction. A logical conclusion is that how innovativeness shapes purchasing intention should be dependent upon specific

purchasing contexts. Despite its intellectual appeal, the concept of consumer innovativeness itself remains very general and abstract in nature. When it comes to a particular shopping context such as online shopping, we argue that the general concept of consumer innovativeness should be untangled as a set of correlated and context-specific constructs that capture consumers' psychological and cognitive mechanisms respectively.

Online transactions must be conducted through computer networks. Therefore, an online buyer must be in the first place willing and capable to operate a computer. As marketing researchers are interested in consumer innovativeness, MIS researchers have taken great interest in identifying innovative technology users. Two influential theoretical perspectives in this field are theory of reasoned action (TRA) [3] and technology acceptance model (TAM) [22, 23]. Both are relevant to the current study because they explain the pivotal role of *attitude* and *behavioral intention* in an individual's decision about whether or not to adopt an innovation. TRA is rooted in social psychology theories and concerned with the determinants of consciously intended behaviors. Two key constructs of this model are attitude and behavioral intention. *Attitude* is defined as an individual's personal convictions and feelings (positive or negative) toward a specific behavior [3]. It is proposed as a variable that mediates the effect of individual difference variables on behavioral intention. TRA offers a parsimonious model in which all other sources of influence on behavior are mediated by attitude. Furthermore, a person's performance of a specified behavior is determined by his or her *behavioral intention* to perform the behavior. Intention is the most immediate determinant of behavior. In order to act, an individual must first intend to act and no action is carried out without intention first. TRA has been proved to be a useful model explaining human behaviors in different domains, particularly in consumer behavior [e.g., 62] and technology acceptance [2, 59].

TAM is an adaptation of TRA specifically tailored for modeling user acceptance of information systems [23]. It argues that an individual's cognitive beliefs influence his or her attitude toward a technology, which in turn, influences this individual's intention to use the technology. Recently, some researchers have modified TAM by adding an affective determinant -- *perceived enjoyment* into the model, which is defined as an intrinsic motivation to use new technology [39, 66]. Corresponding to the innovativeness research in marketing literature, the technology acceptance research has also been shifting attention to the psychological/dispositional factors that affect people's technology acceptance decisions.

3 Research Model

Previous researchers suggest that the effects of consumers' inherent characteristics on online purchasing intention remain largely uncharted [18, 45]. In this paper we propose a research model that captures the antecedents of a potential online consumer's purchasing intention along two dimensions: cognitive and personality factors (see Figure 1). A potential online consumer is a person who has an opportunity to access computers and the Internet (a Web user) but has not yet purchased anything on the Internet. Internet marketers have been strongly interested in "converting" these potential consumers into active online buyers. The purpose of this study was to identify those potential consumers who are more likely to bring themselves to do online shopping.

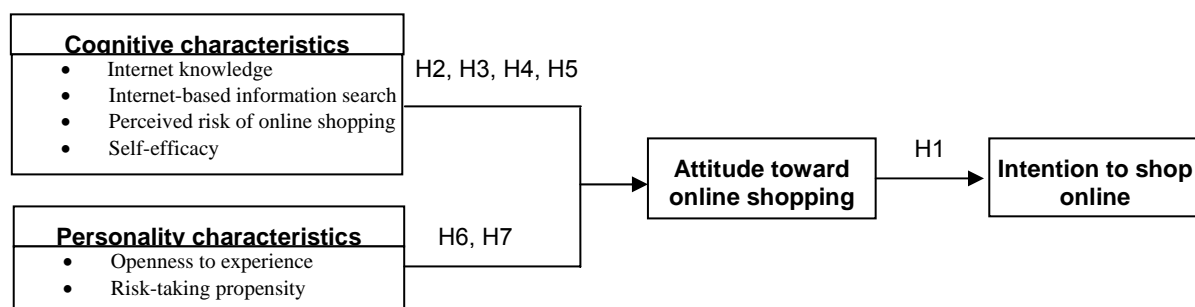


Figure 1: A Theoretical Model about Attitude and Purchasing Intention in Online Shopping

Several issues about the proposed model are worth noting. First, we emphasize that online shopping is an innovative shopping mode. In a general sense, innovation can be anything perceived as new by the potential adopter [21, 60]. We suggest that online shopping represents a new behavioral pattern in the shopping context. To accept online shopping, a buyer needs to go beyond some long-held beliefs about the meaning of "go shopping;" he or she must experience some cognitive changes and even overcome some psychological resistance to the idea of buying things by simply clicking a mouse.

Second, we focus on a potential consumer's *intention* to purchase on the Internet rather than his or her actual purchasing behavior. *Intention to shop online* is defined as one's subjective judgment of the likelihood that he or she would buy products or services on the Internet. This construct captures two things: intention to initiate the purchasing behavior in the near future and estimate of the likelihood to do so. Both TRA and TAM suggest that behavioral

intention be the immediate determinant of overt behavior. For example, Sheppard and colleagues [62] found a significant correlation between intention and action in a meta-analysis of TRA-driven marketing studies. Jackson, Chow, and Leitch [42] found that intentions were reasonable indicators of future system usage. Agarwal and Prasad [1] argued that it would be more appropriate to study intentions than actual usage of technological systems in cross-sectional research because intentions could be measured contemporaneously with independent variables. This point is especially relevant to the current study. As will be discussed below, our theoretical model aims to explain how an individual's relatively stable personal characteristics would affect his or her current purchasing intention.

Third, it is noted that the place of the construct *consumer innovativeness* as a well-established construct in the domain of consumer behavior seems dubious despite elaborate theoretical discussions about the construct [55]. Little specific guidance has been offered on how to operationalize the construct. We suggest that different types of innovations may trigger off different psychological and cognitive processes on the part of the potential adopter. For example, an individual's attitude towards a skill-demanding innovation (e.g., a new hardware or software system) may be heavily influenced by one's knowledge base and learning potential. By contrast, an individual's attitude towards a novel product (e.g., a fashionable automobile) may be more subject to his or her affective responses to the product. As for online shopping, it may be necessary to investigate both cognitive and affective characteristics and their relationships with attitude and behavioral intention. Therefore, we intended to examine some specific individual characteristics in our theoretical model.

Specifically, we were interested in two categories of individual characteristics: *cognition* and *personality*. These two categories of variables have been emphasized in different theoretical perspectives about innovation adoption. Cognitive characteristics refer to a person's knowledge structure and information seeking and processing style, which are mainly associated with the person's learning process and prior experience. Personality characteristics capture the person's innate disposition or inclination. Similar taxonomies of individual difference variables can be found in previous studies [5]. The relationships between these individual characteristics and attitude / intention are discussed as follows.

3.1 Attitude Toward Online Shopping and Intention to Shop Online

We propose that attitude mediates the relationship between individual characteristics and purchasing intention. Attitude refers to an individual's overall affective evaluation of e-commerce as a mode of shopping. Prior researchers suggest that people who hold positive attitudes toward one behavior will be more likely to display that behavior. Attitudes affect information processing, intention formation, and actions [14]. Nelson [56] pointed out that attitude has been the most widely addressed individual-level variable in studies of information-driven innovations. Researchers argued that external variables such as system design characteristics, user personality and cognitive style, task characteristics, etc. would affect user acceptance of technology only *through* internal psychological variables, i.e., attitude towards the technology. This attitude-behavioral intention linkage implies that, other things being equal, "people form intentions to perform behaviors toward which they have positive affect" [23: 986]. Empirical evidence shows that attitude does predict online shopping intention [e.g., 50, 64]. Particularly, the attitude-intention-behavior relationship would be stronger if people have volitional control over their acts [69]. Therefore we have the following hypothesis:

H1: Attitude toward online shopping will be positively associated with intention to shop online.

3.2 Cognitive Characteristics and Attitude Toward Online Shopping

Human cognition involves such mental processes as information acquisition and processing, thinking, reasoning, and decision-making. Certain cognitive characteristics can be used to identify early innovation adopters [60]. Technology acceptance researchers argue that a person's cognitive structure is a main determinant of his or her attitude toward an innovative technological system [12]. In this study we focused on three cognitive characteristics that are particularly relevant to e-commerce and consumers' attitudes and intentions regarding e-commerce.

The first factor is *Internet knowledge*. Prior knowledge, skills, and experiences with respect to a product or a technology play a significant role in shaping a consumer's attitude toward the product or technology. Consumer behavior researchers have paid considerable attention to such cognition-related concepts as product familiarity [15] and consumer expertise [6]. A basic notion is that consumer innovativeness is associated with a consumer's current knowledge of a new product and/or his or her ability to perform product-related tasks successfully. Hirschman [36] argued that prior knowledge of a class of products might lead to greater ability to detect superior new products in that class and hence, contribute to the probability of adopting those new products. A positive relationship between knowledge / skill / expertise / experience and technology usage was also found in the technology acceptance literature [56]. It was found that a potential user's prior experience with computing technology is positively related to his or her attitude toward computers [35]. The first step in developing online businesses usually involves "converting" Internet users to online buyers. An online buyer must first know how to access to the Internet, how to look for specific information via search engines or hyperlinks, how to browse the contents of Web pages, and so on. Thus basic computer skills and Internet knowledge are preconditions under which an individual might develop an interest in online shopping. Internet knowledge can be defined as the level of understanding of the Internet as a communication

and information medium. It can be gained via online experience or from other sources (e.g., technical manuals) [7]. Consumers with high levels of Internet knowledge are less likely to feel frustrated when reading the contents of a web page and hence more likely to hold a positive attitude toward online shopping. So we propose the following hypothesis:

H2: A potential online consumer's level of Internet knowledge will be positively associated with his or her attitude toward online shopping.

Previous researchers have argued that a distinction should be drawn between internal knowledge, or information stored in one's memory, and external information search activity [67]. The latter is defined as "the degree of attention, perception and effort directed toward obtaining environmental data or information related to the specific purchase under consideration" [9, pp. 85]. Consistent with this notion, we suggest that Internet-based information search should be treated as a distinctive factor affecting online shopping attitude. We focus on whether or not a consumer perceives the Internet as a valuable communication and information channel; specifically, whether or not the consumer relies on such information sources as Web advertisements, Web catalogues, hyperlinks and emails to search for product information. While Internet knowledge measures the content of an individual's knowledge, Internet-based information search refers to the major sources from which the individual gets information. It indicates how a person uses his or her knowledge. Rogers [60] suggested that innovators rely more on mass media for information than on interpersonal communications. An innovative consumer would make a buying decision independent of communicated experience with other people [51]. In a similar vein, a novelty seeker can be distinguished from the others in terms of his or her information seeking behavior. It is meaningful to distinguish two types of information sources in the context of e-commerce: the Internet versus traditional mass media and interpersonal communications. Online buyers would make more use of the Internet as an information source just as innovative consumers in the pre-Internet era would use mass media more often. Moreover, the level of Internet use would lead to a positive attitude toward this particular information source. Therefore, we have the following hypothesis:

H3: The more a potential online consumer searches information from Internet-based sources, the more likely he or she would hold a positive attitude toward online shopping.

Self-efficacy refers to "judgments of how well one can execute courses of action required to deal with prospective situations" [8: 122]. It has been widely studied in technology acceptance research [4]. Note that the effect of self-efficacy on attitude is best demonstrated in challenging situations of risk and uncertainty [16]. This is true because self-efficacy reflects an individual's belief in his or her capability to undertake a behavior rather than in the outcomes of the behavior. We expect that a person's self-efficacy would affect his or her evaluative and behavioral response to new products, new technologies, and other new things/situations. Lacking self-efficacy, an individual would not initiate behavioral change even he or she possesses necessary "objective" skill or knowledge and is fully aware of the positive outcomes. Many researchers have suggested that self-efficacy should be explicitly addressed in the technology acceptance theories. Empirical findings also support the relationship between self-efficacy and individual reactions to computing technologies [11, 19, 38]. E-commerce represents a relatively uncertain and risky shopping mode, so self-efficacy should be considered as an important determinant of a consumer's response to e-commerce. An individual with strong self-efficacy would be eager to try new things and less concerned about negative consequences. Therefore, we have the following hypothesis:

H4: A potential online consumer's perceived self-efficacy will be positively associated with his or her attitude toward online shopping.

The fourth cognitive factor is labeled *perceived risk of online shopping*, which is an individual's overall assessment of risk level of online shopping. The concept of perceived risk is related to the fact that consumers are often concerned about the uncertainty and adverse consequences of buying a product or service [25]. Consumers' perceived risk regarding purchasing a specific product or a class of products has been found useful for predicting their product involvement [24, 46] and attitude toward shopping at a particular online store [33]. Here we focused on a potential consumer's general belief about the level of risk involved in online shopping. Since online shopping is subject to the loss of tangibility of products and the lack of face-to-face interactions between the buyer and the seller, it usually implies a higher level of risk from consumers' point of view [10, 33, 68]. However, different individuals may have different perceptions. Following the belief-attitude argument, we argue that individuals who perceive online shopping as very risky (negative outcome expectation regarding the behavior) would hold less favorable attitude toward online shopping.

H5: A potential online consumer's perceived risk of online shopping will be negatively associated with his or her attitude toward online shopping.

3.3 Personality Characteristics

The cognition-attitude linkage is mainly based on the assumption that people's attitudes toward online shopping are influenced by their rational beliefs and self-evaluations. However, some researchers indicated that noncognitive factors play an important role in influencing attitude. In particular, affect-related variables could explain significant

variance in attitude independent of cognitive factors [12]. We propose that two personality traits -- openness to experience and risk-taking propensity deserve special attention in the context of e-commerce. There are two reasons for including these two traits into the theoretical model. First, psychological tendency for taking risk might be at work when an individual is faced with a decision whether or not to purchase on the Internet. In such a context people typically do not have much prior experience of the same kind upon which they could base a rational decision. Given the fact that conventional in-store shopping is still a prevailing mode of shopping, the attractiveness of online shopping largely rests with its novelty and fun. People with stronger psychological tendency for seeking out novelty, regardless of their knowledge and ability level, would readily embrace the idea of online shopping. Second, previous researchers have reported that these two constructs can be used to explain usage of innovative technological systems [5]. It is also reasonable to explicitly examine how these two personality traits would affect attitude and behavioral intention.

Openness to experience is one of the five broad personality factors [48]. People high on this dimension have an interest in varied experience for its own sake. Openness to experience captures such human attributes as vivid fantasy, artistic sensitivity, depth of feeling, behavioral flexibility, intellectual curiosity, and unconventional attitudes [49]. Some innovators' characteristics are highly correlated with openness to experience. For example, many studies have found that innovators are less dogmatic -- a personality trait conceptually opposite to openness to experience [5]. Compared with brick-and-mortar stores and printed catalogues, the Internet-based shopping is certainly a novel stimulus. We suggest that online shopping would satisfy an open individual's aspiration for new and different experience with its innovative features such as interactive communication between buyer and seller, discussion forums, consumers' comments and reviews, variety of selections, price comparison functions, individualized products and services, and so on. Consequently, open individuals would favor online shopping.

H6: Openness to experience will be positively associated with attitude toward online shopping.

Risk-taking propensity is an individual's tendency to take or avoid risks [34, 65]. A basic argument in the extensive body of risk literature is that "risk taking propensity is a general psychological disposition; that is, individuals are inclined to varying degrees to take risks and that this tendency is generalizable across situations and types of risks" [43: 483]. Rogers and Albritton [61] found that early innovation adopters show better ability to cope with uncertainty and risk than late adopters. In the context of e-commerce, few studies have explicitly examined how the online consumers' risk-taking propensity would affect their attitudes and purchasing intentions. In this study, we argue that people with higher risk-taking propensity would be more likely to think favorably of undertaking the behavior of shopping on the Internet.

H7: Risk-taking propensity will be positively associated with attitude toward online shopping.

4 Research Method

4.1 Sample and Data Collection

We collected the data via a questionnaire survey. The initial sample included 492 students from one polytechnic college and two universities in Taiwan. Student samples have often been criticized for their lack of generalizability and representativeness. However, several considerations support the use of a student sample in the current study. First, a large percentage of Web users in Taiwan were college students or young people with college education [47]. Second, by using a student sample we could control the confounding variances caused by such factors as computer access and computer literacy. Third, this study was focused on revealing cognitive and psychological processes of *potential* online consumers; in this sense, college students are representative of the population (i.e., the population of potential online consumers). Moreover, it is not uncommon to use student samples in previous research on online shopping [e.g., 7, 70]. Though we felt it appropriate to use a student sample, we took effort to improve sample variances in demographic characteristics. We selected students from different majors and different academic programs. The sample included only those students who had not yet purchased anything online at the time of the investigation; thus it was a sample of potential online shoppers.

4.2 Measures

We used four demographic variables as control variables: (1) age; (2) gender (0 = "female" and 1 = "male"); (3) educational level (0 = "some college education" and 1 = "undergraduate, MBA, EMBA, and PHD"); and (4) educational background (0 = "high-computer-knowledge areas" and 1 = "low-computer-knowledge areas"). The respondents came from seven major areas: computer science, system engineering and management, management information systems, engineering, business administration, social sciences, and literature. The first four areas were defined as high-computer-knowledge areas while the other three low-computer-knowledge areas. It is reasonable to believe that the students from these three backgrounds are probably not as knowledgeable about computer and network technologies as those from the first four backgrounds. Table 1 shows a profile of the sample. The final sample size was reduced to 473 after list wise deletion of cases with missing data.

Variable	Frequency (n=473)	Percentage (%)
<i>Age</i>		
Under 20	121	25.6
20-29	226	47.8
Over 30	126	26.6
Mean = 26.3 years s.d. = 6.74 years		
<i>Gender</i>		
Male	268	56.7
Female	205	43.3
<i>Educational Level</i>		
College	199	42.1
Undergraduate	165	34.9
Postgraduate	109	23.0
<i>Educational Background</i>		
Technological	172	36.4
Non-technological	301	63.6

Table 1: Respondent Profile

Except for demographic variables, all the other variables were measured by 7-point Likert-type scales with “1” standing for “strongly disagree” and “7” standing for “strongly agree.” The measurement items for each construct are shown in Appendix. Table 2 gives alpha coefficient related to each measurement scale. Specifically, perceived risk of online shopping was measured with one item, which offers a parsimonious measure of the respondent’s overall assessment of the nature of online shopping.

Construct	No. of Items	Reliability
Attitude toward online shopping	3	.72
Intention to shop online	3	.78
Internet knowledge	2	.88
Internet-based information search	4	.73
Self-efficacy	5	.75
Perceived risk of online shopping	1	--
Openness to experience	5	.65
Risk-taking propensity	4	.68

Table 2: Measurement and Reliability

5 Results

Structural equation modeling (SEM) was applied to analyze the data. Prior researchers recommended a two-step approach for SEM [13]. The first step is to test the measurement model through confirmatory factor analysis (CFA). If the measurement model fits the empirical data satisfactorily, then the second step can be taken to estimate the theoretical relationships among the theoretical constructs. This step is usually known as SEM [58].

In the current study, we first tested the measurement model. The measurement model shows how individual measurement items are linked to each construct as specified in theory. The full measurement model included 31 items and 12 constructs. To standardize the measurement scales, we set the factor loading of the first item from each scale to unity [17]. For the five single-item demographic characteristics, we set their factor loadings to unity and the random error variances to zero following Pedhazur and Schmelkin’s [58] suggestion. The CFA shows that the measurement model fits the data well. All factor loadings (λ^x) were significant at the .05 level, which offers primary evidence for convergent and discriminant validity of the measurement model. The value of χ^2 is statistically significant ($\chi^2 = 703.02$, $df = 373$). However, it has been recognized that χ^2 as an indicator of goodness of model fit has its limitation: This statistic is quite sensitive to sample size and frequently indicates poor model fit even though the model fits the data well. In fact, other fit indices indicate that the measurement model fits the data well (RMSEA=.04; NNFI=.89; and CFI=.91), implying that the measurement model accurately capture the patterns of the empirical data.

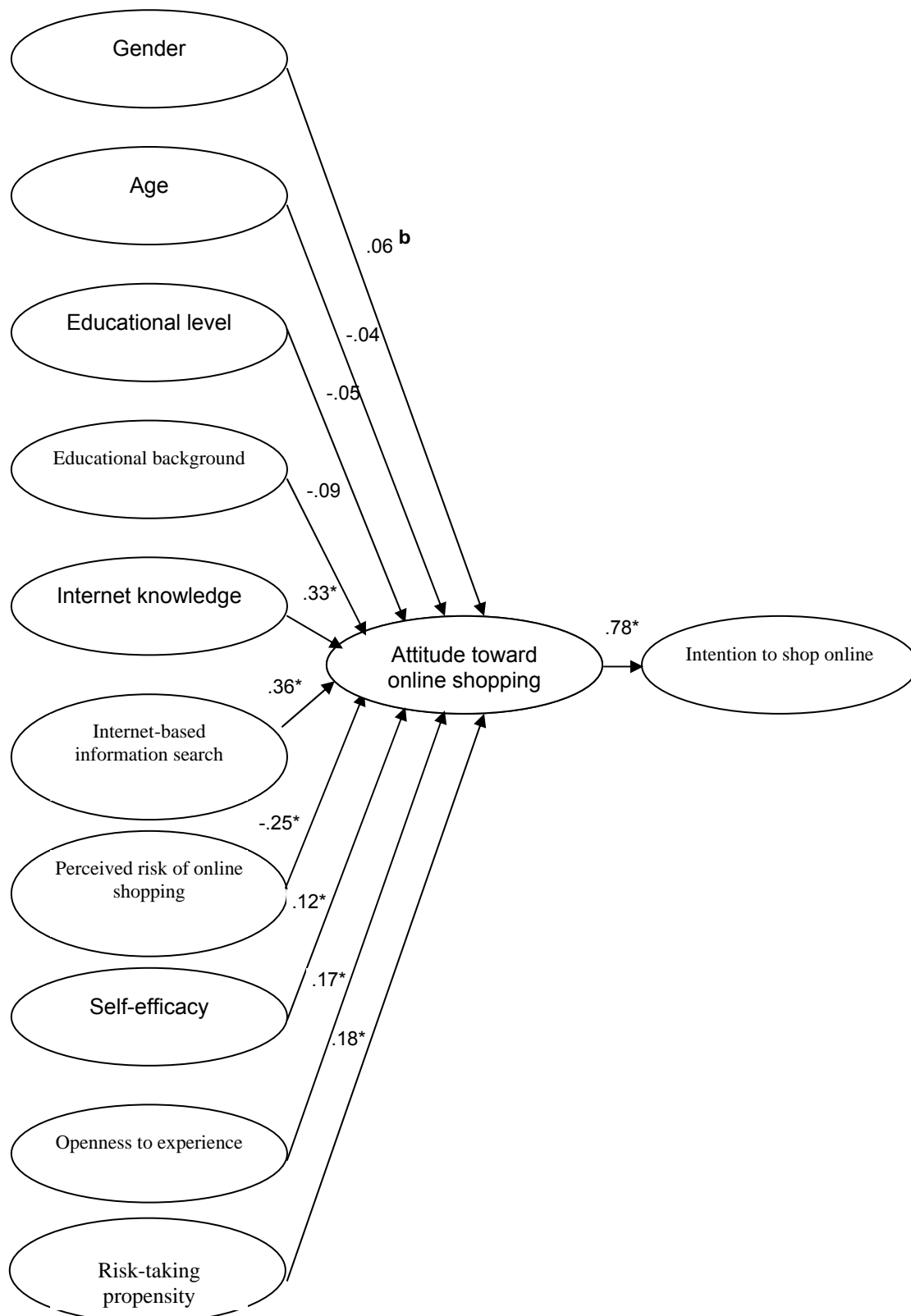
We then conducted SEM analysis to test our hypotheses. The path diagram resulting from this analysis is shown in Figure 2. Again, the full structural equation model fits the data satisfactorily. The estimated values for the factor loadings (λ^x and λ^y) are all statistically significant. The fit indices indicate a good model fit ($\chi^2 = 736.68$, $df=383$; $RMSEA=.04$; $NNFI=.89$; and $CFI=.91$). Moreover, the path coefficients provide direct evidence for hypothesis testing. No significant relationship was found between demographic characteristics and attitude toward online shopping. In contrast, the path coefficients for cognitive and personality variables were all statistically significant and the signs of these coefficients were consistent with the hypothesized directions. These findings offer support for H2 – H7. H1 proposes that attitude toward online shopping mediates the effects of cognitive and personality characteristics on intention to shop online. The value of the path coefficient was .78 and was statistically significant at the .05 level. Thus, H1 was supported.

6 Discussion and Future Research

Online sellers need to formulate their marketing strategies so that they can reach the greatest possible number of Internet users. They are also faced with the task of identifying the Internet users who are most likely to become real online shoppers. A traditional demographic segmentation strategy may help sellers achieve the first objective, i.e., locating potential consumers. However, research shows that demographic segmentation has become increasingly inaccurate because nowadays having access to the Internet is no longer a "privilege" enjoyed by certain demographic groups (e.g., younger, better-educated, and/or higher-income consumers). Because of its interactivity, connectivity, and globality, the Internet has rendered such considerations as geographical location, socioeconomic status, and time-use patterns largely useless as the basis for customer segmentation. Under this circumstance, we suggest that an understanding of unobservable cognitive and psychological attributes of potential buyers would help online sellers find their target customers more effectively.

A major implication of our findings is that online marketers should do more research not only to find out who the customers are but also to understand how they think and feel. We found that, after controlling for age, gender, educational level and background, individuals' attitudes and intentions are significantly affected by their beliefs about how well they can use the Internet and by their novelty-seeking, risk-taking tendencies. For online sellers this means that the key to attracting customers is to facilitate customer learning process and appeal to their curiosity through appropriate web site designs. For example, online technical support, search help, and customer forums may reduce the information processing burden that oftentimes frustrates not so sophisticated Internet users. Also, the affective elements of web design, e.g., graphics and multimedia created to induce customers' emotional responses, can be used to attract novelty-seeking, risk-taking customers. The seller can also create marketing programs that involve customers more in the product design and delivery process. High levels of interactivity between seller and buyer may attract more customers with high levels of self-efficacy. Overall, these findings highlight the potential of psychological segmentation in the context of online shopping.

This study has several limitations, though. The use of a student sample may limit the generalizability of the findings to other groups of potential customers. We focused on general attitude toward online shopping and it should be recognized that attitude and intention may also be influenced by situational factors (e.g., product category, characteristics of web design, etc.). The research model reported here can be seen as a generic model that links key psychological attributes to online shopping attitude. However, more refined research should be done to explore the sensitivity of this model to various contextual conditions. There are several other promising avenues of research. For example, similar studies can be done in other demographic groups. Since some demographic groups that used to stay away from the Internet (e.g., senior citizens or housewives) have begun to develop an interest in this new medium, it is necessary to examine what types of cognitive and psychological characteristics would affect purchasing intentions in these groups. Also, it will be interesting to examine how an individual's cognitive model may change over time through learning process. The focus should be on a person's learning curve with regard to information technologies and his or her technological maturity. It is suggested that the shape of the learning curve will change over time, which in turn, will lead to a time-dependent pattern of cognitive characteristics, attitude, and/or behavioral intention. The knowledge about such dynamics may be obtained through a panel study designed to track the demographic, cognitive, psychological, and attitudinal changes of a specific group of respondents over time. E-commerce has opened a whole new area for both marketing and MIS researchers. We suggest it be a resourceful research avenue to draw upon both streams of thinking and develop integrative models about online consumer behavior.



a Fit indices: $\chi^2 = 736.68$, $df = 383$; RMSEA = .04, NNFI = .89, CFI = .91, GFI = .91.
b estimate of path coefficient: completely standardized solution.
* $p < .05$

Figure 2: Results of Structural Equation Model ^a

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Appendix: Measurement Items for Key Constructs

Attitude toward online shopping

1. I like the idea of shopping online.
2. I don't see any point of trying to buy things on the internet (reversed).
3. My overall attitude toward e-commerce is positive.

Intention to shop online

1. I plan to do online shopping very soon.
2. I think online shopping is worth a try.
3. I intend to use the internet as an alternative channel of purchase.

Internet knowledge

1. I am an experienced Internet user.
2. I know quite well how the Internet works.

Internet-based information search

To what extent have you used the following channels to search for product information?

1. Banner ads
2. Emails from sellers
3. Search engine
4. Hyperlinks appearing on a web page

Self-efficacy [63]

1. When I set important goals for myself, I rarely achieve them (reversed).
2. I avoid facing difficulties (reversed).
3. If something looks too complicated, I will not even bother to try it (reversed).
4. When unexpected problems occur, I don't handle them well (reversed).
5. I avoid trying to learn new things when they look too difficult for me (reversed).

Perceived risk of online shopping

1. I think online shopping is risky.

Openness to experience [20]

1. I am intrigued by the patterns I find in art and nature.
2. Poetry has little or no effect on me (reversed).
3. I have little interest in speculating on the nature of the universe or the human condition (reversed).
4. I have a lot of intellectual curiosity.
5. I often enjoy theories or abstract ideas.

Risk-taking propensity [44]

1. If the possible reward was very high, I would not hesitate putting my money into a new business that could fail.
2. People have told me that I seem to enjoy taking chances.
3. The thought of investing in stocks excites me.
4. Taking risk does not bother me if the gains involved are high.