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Are Values a Good Predictor of Innovativeness toward Online Service Adoption? An Empirical Study

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Abstract

What intrinsically motivates an individual to take shorter time to make a decision of adopting a new online service, such as online short message service (SMS), online ticketing, etc, while others take longer? This study suggests that human values is a determinant of innovativeness toward adopting online services. A questionnaire was administered to 300 undergraduate and postgraduate students in a large public university in Hong Kong. Empirical results showed that individuals with achievement, self-direction and stimulation values were relatively more innovative in adopting online services than others in the social system. On the contrary, people who attach more importance to conformity, security and tradition values were relatively less innovative in adopting online services than others in the social system.

Keywords

Values, online innovations, online services, innovativeness

1. Introduction

What intrinsically motivates an individual to take shorter time to make a decision of adopting a new online service, such as online short message service (SMS), online ticketing, etc, while others take longer? Originated in 1983, Rogers triggered a wide discussion about diffusion of innovation. Rogers (1983, 1995) examines factors that contribute to diffusion of new products. The determinants include relative advantage, compatibility, complexity, trialability and observability (Rogers 1983, 1995). Subsequent research that apply Rogers's theory into the contexts of household products and durable goods proliferates (e.g., Gatignon, Hubert, Eliashberg & Robertson 1989; Steenkamp & Van Trijp 1996).

With today's rapid development of technology, the importance of information technology (IT) escalates and becomes an indispensable part of human life. Innovations are no longer limited

to the context of tangible goods, but extend to products or online services offered on the World Wide Web (WWW). The emergence of IT stimulates a substantial body of research to offer insight on the determinants of IT acceptance (Davis 1989). Major discussion has been focused on validating perceived usefulness and perceived ease of use as the causes of IT adoption.

Both diffusion of innovation literature and acceptance of information technology literature pay significant attention to validating the factors that relate to the *innovation itself* (i.e., relative advantage, compatibility, complexity, trialability, observability, perceived usefulness and perceived ease of use of the innovation itself). For example, Rogers (1995) believes that people are likely to adopt or not adopt an innovation to the extent they perceive the innovation itself is better than the idea it supersedes (i.e., relative advantage). Further, Davis (1989) suggests that people tend to use or not use an IT to the extent they believe the IT itself will help them perform their job better (i.e., perceived usefulness). Given that both literature merely emphasize on investigating factors that relate to the innovation itself, this study extends the investigation by examining the psychometric factor in affecting innovation or IT adoption. This idea is echoed by Agarwal and Prasad (1998) who are interested in investigating the psychological effect on innovativeness toward IT. They theoretically refer the psychological impact on innovativeness as personal innovativeness, and have developed operational measure for the construct.

In this study, a specific facet of the psychological impact on innovativeness is taken into consideration. Human values (or values in the paragraphs below), as a belief that a specific mode of conduct or end-state of existence is more preferable to another (cf. Rokeach 1973), guide one's behavior, including how early one adopts an innovation (i.e., innovativeness). To elaborate, an individual who possess different type of values may have different innovation-decision period, that is, one may take shorter time to decide the adoption of an innovation, while others take longer. This proposition is theoretically similar to Agarwal and Prasad's (1998) general belief that psychometric properties of an individual determine innovativeness. However, this study narrows down the psychometric properties to values only.

To many contemporary research, the concept of values is crucial in understanding consumer behavior. With respect to the fact that substantial attention has been given to the effect of values on consumer adoption (Homer & Kahle 1988; Henry 1976), it is plausible for values to shape consumers' online adoption behavior, including innovativeness.

The contribution of this study is two-fold. First, we establish a theoretical linkage between the specific psychometric property - values and the degree of innovativeness in adopting online innovations (i.e., online services offered by the WWW). Second, we empirically test the relationship between values and the degree of innovativeness in adopting online innovations.

This paper is organized as follows: Section 2 describes the theory development process. Based on the theoretical arguments, three hypotheses are drawn. To empirically test the hypotheses, a self-explanatory questionnaire was designed and administered to 300 undergraduates and postgraduates in a large public university in Hong Kong. Details of the questionnaire-based study are described in the methodology section in section 3. Section 4 reports the statistical analyses and results. The findings are subsequently discussed in the section 5. Section 5 also concludes the paper by pointing out the implication, limitation and direction for future research.

2. Theory Development

2.1 Values

The investigation of values has its root planted in Rokeach's (1973) study - The nature of human values. He defines values as "an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence" (Rokeach 1973). The definition highlights that an individual prioritizes values, prefers one value to another and identifies the relative importances of values. In this study, we employ Rokeach's definition of values

Although an individual may perceive many different value types as important, he or she may still possess certain value type that is relatively more dominant than others. For instance, one may value both success and honesty as important, but one may still be able to report that honesty is a more important value to him or her. He or she is not likely to achieve success at the expense of honesty. A number of value surveys were therefore designed by prior researchers to measure the relative importance of values. Examples of the value surveys include those that are constructed by Scott, Rokeach, and Schwartz (Rokeach 1973, p.422-428; Scott 1965, p.245; Schwartz 1992, p.60-62).

2.1.1 Schwartz's Content and Structure of Values

Schwartz built on Rokeach's concept of values and examined the content and structure of values from 1987 onwards (e.g., Schwartz 1987, 1990, 1992, 1994, 1995, 1997, 1998). Ten value types are identified, namely self-direction, stimulation, hedonism, achievement, power, security, conformity, tradition, benevolence and universalism (Schwartz 1992, 1995). Pairs of compatible value types are located adjacent to each other, whereas conflicting value types are situated in opposite direction. There are two bipolar dimensions (i.e., openness-to-change versus conservation dimension, and self-enhancement versus self-transcendence dimension), each dimension encompasses a higher-order value domain that is in opposition to another higher-order value domain. (See Figure 1)

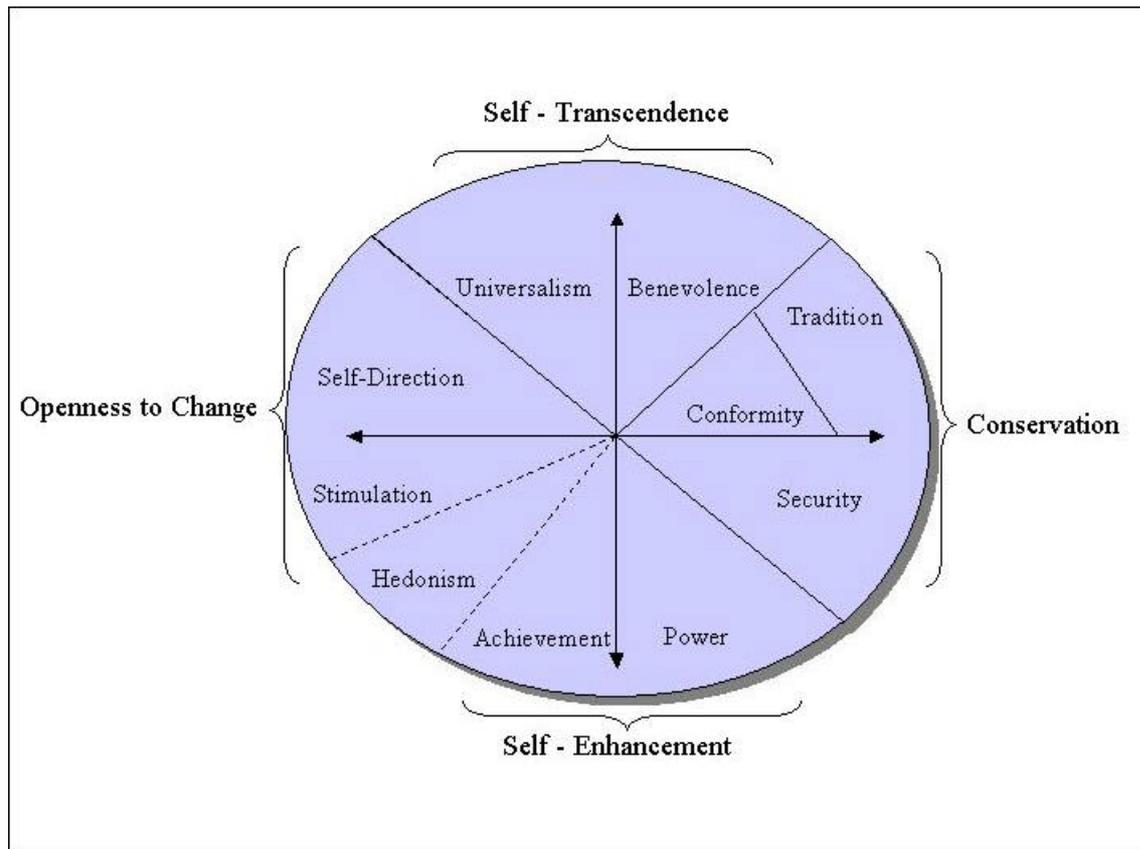


Figure 1. Structure of Values (Source: Schwartz 1992).

Value domains and the definitions of value types are summarized at Table 1 below.

Openness to Change		Conservation		
Self-Direction	Stimulation	Conformity	Tradition	Security
Independence Control Autonomy Freedom	Novelty seeking Variety seeking Excitement Risk taking	Obedience Restraint of actions, inclinations and impulses	Acceptance of others' ideas Follow norms of behavior	Safety Harmony Stability

Self-Transcendence		Self-Enhancement		
Universalism	Benevolence	Power	Achievement	Hedonism ¹
Understanding, appreciation, tolerance and protection for the welfare of all people and for nature	Understanding, appreciation, tolerance and protection for the welfare of close others in everyday life	Social status Prestige Control and dominance over others	Personal success Competence	Satisfaction from needs and pleasure

Table 1. Value Domains and Definitions of Value Types.

For the paragraphs below, we use the term “self-direction individuals” to refer to individuals with self-direction values. The same pattern applies to all value types.

2.2 Values and Innovativeness of Adopting Online Innovations

Understanding values is important to the investigation of online innovations because how early one adopts an innovation is associated with value elements. Rogers (1995) claims that each adopter category carries some dominant characteristics and *values*. Most, if not all, dominant characteristics of adopters mentioned by Rogers’s (1983, 1995) are equivalent to the motivational goals of the value types as documented by Schwartz (1992). For example, innovative individuals are characterized by novelty seeking and risk taking, while the two characteristics are the central goals of stimulation values. Similarly, resistance to change and conform to experienced others opinion or action are the primary characteristics of less innovative individuals, they are in line with the defining goals of tradition and conformity values. On top of that, values have always been used as a basis for market segmentation in the offline retailing environment (e.g., Kamakura & Novak 1992). In a similar vein, it is also relevant to online market segmentation. It is plausible to segment online shoppers by their value types and hence examine the innovativeness of different value groups.

Rogers (1983, 1995) defines innovativeness as “the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas than the other members of a system”. The concept is widely examined and documented in the literature (e.g., Agarwal & Prasad 1998; Evans 1995; Frain 1999; Zmud 1983). A number of research studies

¹ Schwartz (1992) encloses hedonism value type by broken lines because he believes that it shares some elements with the openness to change type and some elements with the self-enhancement domain. Subsequently, Feather(1995) includes hedonism in the self-enhancement domain (Feather 1995; Steenkamp, Hofstede & Wedel 1999)

investigate the association between innovativeness and personality traits (e.g., Foxall 1988; Steenkamp & Baumgartner 1992; Venkatraman & Price 1990; Zuckerman 1979). Results indicate that innovativeness is positively correlated with personality traits: optimum stimulation level, independence, risk taking, inner-directed social character, capacity for status, and negatively correlated with conservatism, dogmatism and need for structure. The aforementioned personality traits consist of most properties of values. Stimulation and risk taking are the motivational goals of stimulation values; independence and inner-directed social character are pursued by self-direction individuals; conservatism, dogmatism and need for structure are especially important to conformity, tradition and security individuals (Schwartz 1992). The positive association between personality traits and innovativeness forms a preliminary prediction of the positive relationship between values and innovativeness.

Values also seem to be able to provide a strong theoretical basis for understanding innovativeness. To many contemporary research, the concept of values is crucial in understanding consumer behavior. Theoretical contention suggesting that values have a causal influence on subsequent adoption, such as adoption of nutrition and natural food (Homer & Kahle 1988), and of automobile (Henry 1976), have been voiced by many researchers. Homer and Kahle (1988) confirm the sequential relationship between values, attitude and (adoption) behavior. In sum, there may be ample theoretical evidence to show that values ultimately affects consumer adoption. In light of the above findings, it is reasonable to believe that values also shape individuals' online adoption behavior, including innovativeness - the degree to which a person adopts online innovations relatively earlier than other members of a social system.

2.2.1 Close Proximity of Achievement Values to the Openness-to-Change Domain

Referring to Schwartz's (1992) structure of values, achievement values are subsumed under the self-enhancement domain. At the first glance, achievement values are not in close proximity to openness-to-change domain, because achievement values and openness-to-change domain are separated by the hedonism values as depicted in Schwartz's structure of values. However, this study attempts to point out that achievement values are closely related to the openness-to-change domain. (the self-direction-stimulation combination).

Prior researchers found that achievement values are closely related to self-direction values (e.g., McClelland, Atkinson, Clark & Lowell 1953). McClelland et al.'s (1953) definition of achievement motivation is to meet internal standards of excellence, achievement values "is closely related to self-direction values" (Schwartz 1992). With reference to Mehrabian Achieving Tendency Scale (MATS) (Mehrabian 1969; Mehrabian & Bank 1978), independence, willingness to assume risk and stimulation are part of the measurements of achievement. The first measurement is congruent with the central goal of self-direction values and the last two are in consistent with the defining goals of stimulation values.

Last but not least, Schwartz's measuring items of self-direction and achievement values are similar. While self-direction individuals are motivated by independent thinking, achievement individuals perceive logical thinking as their defining goal (Schwartz 1992). Both of them find *thinking ability* and *independent judgment* especially important to them. In the context of adopting online innovations, they probably express some degree of motivation to rely on their thinking ability to *independently* evaluate whether to adopt online innovations. Overall, achievement values are not as far apart from openness-to-change domain as depicted in Schwartz's structure of values. In essence, achievement values are likely to be compatible with the openness-to-change domain in nature.

2.2.2 Relationship between SSA (Self-Direction, Stimulation and Achievement) and Innovativeness of Adopting Online Innovations

Schwartz (1992) points out that the values underlying the bipolar value dimension of openness to change (*self-direction and stimulation*) versus conservatism (conformity, security and tradition) are in conflict. Openness to change “arrays values in terms of the extent to which they motivate people to follow their own intellectual and emotional interests in unpredictable and uncertain directions”. We propose that self-direction and stimulation exert a positive effect on innovativeness in general.

As mentioned earlier, achievement values have close proximity with the openness-to-change domain (self-direction and stimulation), it seems that the proposed positive effect between openness to change and innovativeness applies to the relationship between achievement values and innovativeness as well. In this study, we examine the joint effect of self-direction, stimulation and achievement (SSA) values on innovativeness toward online innovations. In the context of consumer adoption toward online innovations, SSA individuals are likely to adopt the innovative online shopping relatively earlier than other members in the social system, because they tend to follow their own intellectual and emotional interest to adopt the new online innovations even it is a new and uncertain adoption mode

We refer to Feather’s (1995) concept of resultant score of openness to change and recommend the concept of resultant score of SSA (self-direction, stimulation and achievement). We expect that the higher the resultant score for SSA relative to the resultant score for conservation, the higher the degree of innovativeness of an individual.

Hypothesis 1: Resultant score of SSA has a positive effect on the degree of innovativeness in adopting online innovations.

2.2.3 Relationship between Conservation domain and Innovativeness of Adopting Online Innovations

As mentioned before, openness to change and conservation are situated in the bipolar value dimensions. Conservation should have an exactly opposite effect on innovativeness when comparing with the proposed positive effect of openness to change on innovativeness. While individuals with openness-to-change domain are likely to incline toward innovations, those conservative ones tend to decline innovations. Conservation “arrays values to preserve the status quo and the certainty it provides in relationships with close others, institutions, and traditions” (Schwartz 1992). In the context adopting online innovations, consumers who are conservative are likely to be relatively less innovative, because adopting the new online services alters their old ways of doing things, and breaks the tradition and norms of behavior. They may refuse to adopt online innovations or take longer adoption time than others in the social system.

In terms of resultant score, an individual who has a positive resultant score for conservation (cf. Feather 1995) indicates that he or she is resistant to alter the existing situation, and is not in favor of breaking traditional pattern and social norms. We hypothesize that resultant conservation has a negative effect on individuals’ innovativeness in adopting online innovations. In other words, the higher the resultant score for conservation relative to the resultant score for openness to change, the lower the degree of innovativeness in adopting online innovations.

Hypothesis 2: Resultant conservation has a negative effect on the degree of innovativeness in adopting online innovations.

2.2.4 Relationship between Self-Enhancement Domain and Innovativeness of Adopting Online Innovations

Another bipolar dimension mentioned in Schwartz's (1992) structure of values is self-enhancement (power, achievement, and hedonism) versus self-transcendence (universalism and benevolence) dimension. In order to keep the originality of Schwartz's conceptualization of self-enhancement, achievement values are included in self-enhancement domain to empirically test for its effect on innovativeness. Self-enhancement versus self-transcendence dimension "arrays values in terms of the extent to which they motivate people to enhance their own personal interests (even at the expense of others) versus the extent to which they motivate people to transcend selfish concerns and promote the welfare of others, close and distant, and of nature" (Schwartz 1992).

Self-enhancement versus self-transcendence dimension is probably less plausible to affect innovativeness than the openness-to-change versus conservation dimension. It is because the motivational goals of power, achievement and hedonism values (e.g., social power, logical thinking, pleasure) may have an overall weak conceptual linkage with innovativeness toward adopting online innovations. For example, hedonism values (e.g., pleasure) appear to be weak in explaining innovativeness. Besides, power individuals express the motivation to have control over others, and there seems to be a weak association between control over others and innovativeness. Although achievement values appear to effectively affect innovativeness because achievement individuals rely on their logical thinking to make independent (online adoption) decision, the overall conceptual linkage between self-enhancement (power, achievement and hedonism) and innovativeness toward adopting online innovations is weak.

Moreover, as echoed by Steenkamp et al. (1999) that resultant self-enhancement does not affect innovativeness in general. We hypothesize that resultant self-enhancement has no effect on individuals' degree of innovativeness in adopting online innovations. We expect that the bipolar dimension of self-enhancement versus self-transcendence is not important in shaping individuals' innovativeness toward adopting online innovation.

Hypothesis 3: Resultant self-enhancement has no effect on the degree of innovativeness in adopting online innovations.

3 Methodology

3.1 Material

A paper-based questionnaire that consisted of two sections, values and innovativeness of adopting online services, was administered.² A number of demographic items were also included in the questionnaire.

3.1.1 Measurement of Values

A Chinese version of Schwartz's value survey was used in this study. The Chinese version was obtained from Morris's (1998) study. Since there was still room to improve some of the translations in Morris's translated value survey, we refined the instrument by making moderate changes to the items. The instrument refinement phase relied on the card-sorting method developed by Moore and Benbasat (1991). Two rounds of card sorting were

² The instrument is available upon request.

performed so as to ensure its face and content validity (Moore & Benbasat 1991). The final instrument contained 44 value items that measured the 10 value types.

3.1.2 Measurement of Innovativeness toward Online Innovations

This study applied Mahler and Rogers's (1999) measurement to measure individuals' innovativeness in adopting online services. A list of *new* online services should be presented to respondents so as to record their relative time of adopting the online innovations. It may be inevitable that researchers need to subjectively determine what online services, at a given time, are in fact, *new*. To avoid subjectivity, a long list of partly-diffused online services was presented to 10 Master students. They were asked if they had ever used, and estimated the percentage of mass diffusion of the online services. Based on the Master students' comment, 7 new online services were finally short-listed and included in the questionnaire.

3.2 Pilot Test

A pilot questionnaire was administered to 40 Master-degree candidates in a large public university in Hong Kong to evaluate the length, wording and clarity of the questionnaire (cf. Moore & Benbasat 1991), improvements were made accordingly.

3.3 Sample

The sample was composed of 300 students, including undergraduate and postgraduate students in a large public university in Hong Kong. The limitation of getting student sample were alleviated by enhancing the generalizability power of the result to the population because the sample consisted of both undergraduates and postgraduates. Postgraduates were diversified in terms of their age, income, occupation, etc. Participation in the survey study was voluntary. Subjects were provided with the incentive of winning a lucky draw, which composed of 3 prizes, with approximately US\$128 shopping coupons each.

4 Results

4.1 Measures

After replacing missing data and removing outliers, 274 cases of data were ready for analysis. 137 were undergraduate students and another 137 were postgraduate students. 56% of the respondents were male and 44% were female.

We measured Cronbach Alpha's reliability of the pool of data. The value types had the following reliabilities: Self-direction ($\alpha=0.60$), stimulation ($\alpha=0.85$), hedonism ($\alpha=0.66$), achievement ($\alpha=0.68$), power ($\alpha=0.71$), security ($\alpha=0.58$), conformity ($\alpha=0.75$), tradition ($\alpha=0.67$), benevolence ($\alpha=0.79$) and universalism ($\alpha=0.66$). At the first glance, the low reliability levels of some constructs appear to be unrespectable. However, it is important for us to take the formative nature of indicators into account, we should eventually be able to understand that the reliability scores are in fact respectable. Formative indicators cause the latent variable (Chin 1998). For example, curious, freedom, choosing own goals, independent, and self-respect are the formative indicators that cause self-direction. The indicators are in diversified dimensions. The diversified nature of formative indicators results in low reliability. Therefore, the reliability scores are actually highly respectable considering that the ten value types are made up of formative indicators.

The relationship between values and innovativeness toward adopting online innovations was analyzed by SPSS for Windows (version 11.0.1, 2001). Bivariate correlation analysis was performed to understand the correlation between resultant scores and innovativeness scores.

An index of the importance of a value domain is obtained by computing the mean importance for each value type separately, and subsequently averaging the importances attributed to the value types within each domain. A resultant score for a particular value domain is computed by subtracting the mean importance score of the value types within the opposite domain from the mean importance score of the value types within the particular value domain (cf. Feather 1995, Schwartz, 1992, Steenkamp 1999).

Innovativeness score was obtained by averaging the adoption periods of the 7 online services; if one had never used a particular service, one would receive a score of zero for that service. In other words, innovativeness score would be higher if respondents had ever used *more* online services or they adopted the online services *earlier*.

4.2 Hypothesis Testing

With respect to the effect of value domains on innovativeness, hypothesis 1 posited that the higher the resultant score of SSA values, the higher the innovativeness score. This hypothesis was supported (Pearson correlation=0.163, $p < 0.01$). Result from hypothesis 2 was also in line with our expectation. The effect of resultant conservation on innovativeness was a significantly negative one (Pearson correlation=-0.138, $p < 0.03$). Hypothesis 3 was tenable, resultant self-enhancement did not have any effect on innovativeness toward adopting online innovations (Pearson correlation=0.082, $p > 0.10$). The effect of self-enhancement versus self-transcendence dimension was not important in shaping innovativeness. The results are summarized below by a correlation matrix (Table 2).

	Innovativeness
Resultant SSA	0.163** (H1)
Resultant Conservation	-0.138* (H2)
Resultant Enhancement	0.082 (H3)

**denotes significant at 0.01 level.

*denotes significant at 0.05 level.

Table 2. Summary of Correlation Matrix and Hypotheses Testing Results.

5 Discussion and Conclusion

5.1 Discussion

5.1.1 Plausible Explanation for the Positive Joint Effect of Achievement, Self-Direction and Stimulation Values on Innovativeness of Adopting Online Innovations

5.1.1.2 In terms of novelty seeking, variety seeking and excitement

Stimulation individuals attach more importance to novelty, variety and excitement (Schwartz 1992). Seeking novelty is in line with the idea of adopting innovations. The innovative

online service adds variety to traditional service. Online innovations, such as online ticketing, download of ring tone, etc, are new services that make stimulation individuals feel excited.

5.1.1.3 In terms of risk taking

Stimulation individuals are thrill-seeking (Schwartz 1992; Steenkamp & Baumgartner 1992). In accordance with MATS, achievement individuals are willing to assume risk (Mehrabian & Bank 1978). Adopting online innovation is risky because new ideas have higher chances of getting occasional setback than the well-developed products or services (Rogers 1995), however, stimulation and achievement individuals are willing to take the risk.

5.1.1.4 In terms of independence

The motivational goals of self-direction values are independence and autonomy (Schwartz 1992). Self-direction individuals pursue independent thought and judgment (Curtner-Smith, Bennett & O'Rear 1995; Schwartz 1992). They also rely on their own thinking ability to tackle problems (e.g., Curtner-Smith 1995; Kohn & Schooler 1983).

Achievement values express independence as self-direction values do. MATS (Mehrabian 1978) characterizes independence as one of the measurements of achievement.

Both self-direction and achievement individuals emphasize on independence. The one who has independent problem-solving ability generally takes shorter time to make an adoption decision toward online innovations than those who need to consult the opinion of experienced others. It is because the former does not need to wait for the advice from the experienced others.

Overall, the above are the plausible explanations for self-direction, stimulation and achievement individuals to be relatively more innovative than others in the social system because they are novel, venturesome and independent enough to adopt online innovations earlier.

5.1.2 Plausible Explanation for the Negative Joint Effect of Conformity, Security and Tradition Values on Innovativeness of Adopting Online Innovations

5.1.2.1 In terms of relying on experienced others

Contrary to self-direction and achievement individuals, conformity individuals are low in independence (Klute, Crouter, Sayer & Michael 2001; Kohn & Schooler 1983). They have longer innovation-decision period because they prefer to consult opinion of the experienced others (Midley & Dowling 1978). They do not get advice from the experienced others until the experienced people adopt the online innovation. The waiting time incurred can be a possible reason for the adverse effect of the conservatism on innovativeness. Moreover, conformity individuals follow the norm of behavior set up by the experienced others. They are likely not to adopt the online innovations until most others in the social system have done so.

5.1.2.2 In terms of resistance to change

The motivational goals of security values are stability of society, of relationship, and of self (Schwartz 1992). Security individuals are not likely to adopt innovative online services, because it breaks stability of having conventional offline service. Tradition individuals resist change and oppose to the break of established norms (Schwartz 1992). Similar to conformity

individuals, they are not in favor of new online services because online services are different from the existing services.

Overall, significant negative effect between the conservation domain and innovativeness may be due to the resistance to change and reliance on experienced others of conformity, security and tradition individuals.

5.1.3 Plausible Explanation for the Absence of Effect for Self-Enhancement Domain on Innovativeness of Adopting Online Innovations

Self-enhancement domain does not affect innovativeness toward adopting online innovations. It may be due to the fact that the motivational goals of power, achievement and hedonism values (e.g., social power, personal success, pleasure) have an overall weak conceptual linkage with innovativeness.

5.2 Conclusion

Our findings provide some explanations on “what intrinsically motivates an individual to take shorter time than others to adopt online innovations while others take longer”. Our results suggest that values play a role in determining how early an individual adopts online innovations. The results in this study are consistent with our expectation. Results show that individuals with values in the openness to change domain are more innovative in adopting online innovations than others in the social system, while individuals with values in the conservation domain are less innovative. Also consistent with our prediction, there is an absence of effect for both self-enhancement and self-transcendence domains on innovativeness of adopting online innovations. Overall, this study specifically sheds light on suggesting that values shape individuals’ innovativeness of adopting online innovations.

5.2.1 Implication

Individuals who attach more importance to SSA values such as novelty seeking, variety seeking, excitement, daring and independence are more innovative toward online innovations. SSA values may serve as a guide for online marketers to strategically design marketing campaigns to appeal to the innovative consumers. During the promotion of a new product or online service on the World Wide Web, we suggest online marketers to design web interface or put online advertisement that convey the message of novelty, variety, excitement, venture and independence so as to attract innovative consumers to adopt the new product or online service. Steenkamp, Baumgartner and Van Der Wulp (1996) agree that advertisement with novel message can effectively attract innovative consumers. On top of that, website designers may design interface with a variety of novel styles or eye-catching color match so as to appeal to innovative consumers. Forum or product review can also be included in the website to facilitate innovators to *independently* seek product information.

Although it is by no means an easy task to successfully attract innovative consumers, the idea of designing online interface that is strategically based on the SSA values can be a plausible and helpful one. An even more challenging task is to attract less innovative consumers. Less innovative consumers are conservative and possess values like following experienced others’ opinion and behavior, risk adverse, resistance to change and less independence. Taking reference to the values of less innovative consumers, website designers may design online interface to alleviate their concerns. For example, during the promotion of a new product or online service, the website may show customers’ success story of using the innovative

product or online service. This not only provides the less innovative consumers with others' successful experiences, but also reduces their perceived risk of adopting the new product or online service.

5.2.2 Limitations

As in most empirical research, this study has several limitations. Therefore, care must be taken when interpreting its results. First, this study adopts Mahler and Rogers's (1999) measurement of innovativeness, which is one of the measuring methods of innovativeness. In fact, there are a number of instruments for measuring innovativeness. Examples of innovativeness measurements are Exploratory Acquisition of Products Scale (Steenkamp, Hofstede & Wedel 1999), Arousal Seeking Tendency Scale (Mehrabian 1978; Mehrabian & Russell 1974), Sensation Seeking Scale (Zuckerman 1979), Raju's (1980) innovativeness scale. Future studies may substitute the measurement of innovativeness in this study with other innovativeness scales. Nevertheless, we believe that Mahler and Rogers's (1999) measurement of innovativeness suits well to the context of this study. It is because among the above mentioned innovativeness scale, only Mahler and Rogers's (1999) measurement requests respondents to specify how early they adopt innovative services.

Second, the subjects are final-year students and postgraduate students from the same university. 99% of the subjects are aged between 18 and 42. The extent to which the results can be generalized across different sectors and different age groups of the Internet user population could be limited. Nevertheless, this study enhances the generalizability of the sample by including postgraduate students who are diversified in occupation, age, income, etc.. Moreover, the subjects should be representative of the Internet user population because they fall within the 18-42 age group which forms over half of the Internet users in Hong Kong (Nielsen/NetRatings HK 2002).

Third, this study is conducted in Hong Kong, thus the generalizability of the research is limited to Hong Kong. Without doubt, there are cultural differences among countries. What's more, there could be different value systems in countries with different cultures (Schwartz & Bardi 2001). It is plausible that Asians tend to be more conservative while Westerners are likely to be more open to change. In spite of this, the values that attach to the subjects of this study do not skew toward a particular domain. There are 81, 80, 73 and 73 subjects who prefer openness to change, self-transcendence, conservation and self-enhancement respectively. The number of subjects who prefer openness to change, self-transcendence, conservation and self-enhancement is rather similar, with a standard deviation of 4.16 (which is considered as low variance). A possible reason for having similar number of subjects in different value domains may be due to the fact that Hong Kong is an international city where Hong Kong people are influenced by cultures from all around the world. Overall, the value systems of the subjects in this study spread rather evenly across the 10 value types. The values of the overall subjects do not skew toward a particular domain. Having said that, the study could be replicated in other countries to gain further inter-cultural understanding of the current research question.

Despite the limitations discussed above, this study had paid considerable attention to each research phase, including research design, instrument validation, pilot testing of questionnaire, sample selection and data analysis. Although caution has to be taken when interpreting the results of this study, this study has advanced our understanding of the impact of an individual's values on his or her innovativeness of adopting online services.

5.2.3 Direction for Future Research

Although a significant relationship between values and innovativeness of adopting online innovations is drawn from the current study, this theoretically sound relationship is not able to develop to its full potential if the degree of innovativeness cannot be improved by effective website design. To elaborate, since values are inherently born with individuals, it seems that the significant negative association between conservative values and innovativeness cannot be rectified. However, we suggest that appropriate website design can improve individuals' degree of innovativeness toward online innovations. Having said that, this study moves one big step further in understanding the relationship and pave the way for future studies to base on values to design effective website features that attract online shoppers with different degree of innovativeness toward adopting online innovations. Further research can focus on examining what interface design is appealing to consumers with different degree of innovativeness or consumers with different values.

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