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Honglei Li
Swansea University, h.li@swansea.ac.uk

Vincent S. Lai
The Chinese University of Hong Kong, sklai@baf.msmail.chuk.edu.hk

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Honglei Li
Swansea University
H.Li@swansea.ac.uk

Vincent S. Lai
The Chinese University of Hong Kong
sklai@baf.msmail.cuhk.edu.hk

ABSTRACT

Virtual communities (VCs) have emerged as a new form of business model in the electronic business field. Understanding the motivations behind members' participation is essential for VC organizers. VC participation behavioral intention is a major factor to shape VC participation behavior and it is very important to investigate factors influencing VC behavioral intention. Using the Triandis model of interpersonal behavior, this paper investigated antecedents of behavioral intention to participate in VCs. The results showed that affect, social factors, and perceived consequences are effective in explaining the behavioral intention to participate in VCs. The result also raised the issue of different types of communities' interaction effects on different strength of relationships.

Keywords

Virtual communities, behavioral intention, Triandis model, affect, social factors, perceived consequences.

INTRODUCTION

Virtual communities (VCs) have been an essential part of business applications. According to Hagel and Armstrong (1997), acquisition of VC participants is the prerequisite of shaping and operating a VC. Consequently, issues such as how to attract people to participate in VCs become critical for VC organizers to manage their VCs successfully. Many past studies on adoption of information technology regarded that people's acceptance of information technologies mainly depends on factors like perceived usefulness and perceived ease of use based on Technology Acceptance Model (TAM) (Davis, 1989), which is called cognitive factors by Gupta and Kim (2007). However, the emotional, affect enhancing, and the social psychological factors such as pleasure (Gupta & Kim, 2007), sense of belongings (Blanchard & Markus, 2004), and social identity (Song & Kim, 2006) emerge to be more important in people's acceptance of information technologies. The reason perhaps lies in the social nature of the VC software itself. Thus, it is worthy to investigate what influence people's motivation to join VCs.

Behavioral intention has long been regarded as a crucial antecedent of actual behavior in many technology adoption models such as the TAM (Davis, 1989), Theory of Planned Behavior (TPB) (Ajzen, 1991), and Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975). Previous studies have shown that studies on antecedents on VC participation behavioral intention are very limited. Thus antecedents based on social psychological factors will be appropriate to find what factors influence VC behavioral intention and answer the question of what attract people to participate in VCs.

The aim of this paper thus intends to explore antecedents of people's intention to participate in VCs based on the Triandis Interpersonal behavior Model. At the same time, the interaction effect of community type toward the strength of the relationship is also examined. Specially, three antecedents—affect, perceived consequences, and social factors—together with their relationship strength across the type of communities are examined with Lisrel 8.70 by data collected from three online communities. The result showed that all of these three factors are very significant in determining members' behavioral intention to participate in VCs at different levels.

THEORETICAL BACKGROUND

Previous studies have shown that the antecedents of behavioral intention to participate in VCs are seldom investigated. However, behavioral intention plays a very important role in predicting people's actual behavior (Kim & Hunter, 1993; Sheeran, 2002). This section thus first reviewed the behavioral intention's important role to actual behavior, followed by the review on antecedents of behavioral intention to participate in VCs. The Triandis interpersonal behavior model adopted in this study is also introduced in this section.

The Importance of Behavioral Intention to VC Participation

Behavioral intention is believed to be one of the most important constructs in predicting actual behavior in several adoption and other social psychological theories, including the TAM (Davis, 1989), TRA (Fishbein & Ajzen, 1975), TPB (Ajzen, 1991), and Triandis's attitude-behavior theory (Triandis, 1977, 1980). In these theories, it is proposed that the most

immediate and important predictor of a person's behavior is his/her intention to perform it, which has been widely validated in an impressive range of social behaviors such as diet, physical activities, leisure decisions, academic activities and achievement, voting, occupational choice, driver behavior, etc (Sheeran, 2002). In IS field, the effect of behavioral intention on actual behavior has also been extensively validated in various technology-related environments such as word processing software (Davis, Bagozzi, & Warshaw, 1989), e-banking (Lai & Li, 2005; Pikkarainen, Pikkarainen, Karjaluoto, & Pahnila, 2004), Broadband (Oh, Ahn, & Kim, 2003), electronic commerce (Bhattacherjee, 2001), e-shopping (Shih, 2004), virtual stores (Chen, Gillenson, & Sherrell, 2004), digital library (Hong, Thong, Wong, & Tam, 2001-2002), wireless finance (Kleijnen, Wetzels, & Ruyter, 2004), e-learning systems (Ong, Lai, & Wang, 2004), healthcare technology (Chau & Hu, 2002), Moderated Group Chat (MGC) (Dolen & Ruyter, 2002), etc.

The explanation power of behavioral intention is also significant. In a meta-analysis of intention-behavior relationship from several models including TRA and TPB, the average variance of behavior explained by intention is 28% based on 422 hypotheses and a total sample size of 82, 107 (Sheeran, 2002). Its prediction power is quite stable in IS adoption research, for example, 39% variance explained in adoption of WWW (Moon & Kim, 2001) and 40% variance explained in the acceptance of word processing software (Davis et al., 1989).

Although behavioral intention is very important in predicting actual behavior, the antecedents of intention to participate in VCs haven't been explored very much yet. In effect, only several studies investigated the antecedents of members' behavioral intention to participate in VCs and the result showed that social and affect-related factors are main reasons for people's intention to participate (Bagozzi & Dholakia, 2002; Song & Kim, 2006; H.-H. Teo, Chan, Wei, & Zhang, 2003).

Based on the intention-behavior relationship reviewed above, the behavioral intention should be very important to attract members to come to VC and participate in VC activities. The result of the previous literature also showed social and affect-related factors emerge to be the major determinants of behavioral intention. Thus investigating what factors influence behavior intention of VC participation can answer what factor influencing people's intention to come to a VC. However, the previous studies didn't explore very much in this perspective. This paper thus tries to use the Triandis interpersonal model to explore the antecedents of behavioral intention to participate in VCs.

The Triandis Interpersonal behavior Model

Besides the TAM model, there are other models in previous IS study to examine the behavioral intention, such as TRA (Fishbein & Ajzen, 1975), TPB (Ajzen, 1991), and Triandis Interpersonal behavior model (Triandis, 1980). We choose the Triandis behavior model not only because it considers social psychological reasons such as social factors, cognitive factor such as perceived consequences, but also because it considered the emotional factor affect. The detailed introduction of the Triandis model can be a support for this.

The Triandis interpersonal behavior model was proposed by Triandis in 1977 and later developed in 1980 and the behavioral intention from the Triandis model can be described by an equation:

$$I = w_S S + w_A A + w_C C$$

The equation states that the behavioral intention (I) in the first equation is a function of social factors (S), affect (A) and perceived consequences (C). w represents weight, which ranges from 0 to 1. Affect refers to one's cognitive feeling toward the behavior, social factors refer to the internalization of the individual's subjective culture of the group of people with whom he or she interacts most often, and consequences refers to the values the behavior may bring to the individual after the person performs the behavior.

Since its introduction, the Triandis model has been adopted in many studies in different fields and different contexts (Bamberg & Schmidt, 2003; Bélanger, Godin, Alary, & Bernard, 2002; Boyd & Wandersman, 1991; Brown et al., 1996; Hom, W, Hulin, & L, 1981; Jacques, 1997; Maticka-Tyndale, Herold, & Mewhinney, 1998; Maticka-Tyndale, Herold, & Oppermann, 2003; Verplanken, Aarts, & Knippenberg, 1994; Zalesny, 1985). Both Triandis and some researchers (Bamberg & Schmidt, 2003; Boyd & Wandersman, 1991) believe that his model is superior to and complements the previous Fishbein (1975) model of attitude-behavior relationship—the TRA—the general behavioral model before the Triandis Model.

In addition to attitude-behavior studies, the Triandis model has been applied to other contexts, with satisfactory results. In the early 1990's, the Triandis model was adopted in the Management Information Systems discipline for the investigation of IT-related phenomena (Al-Khaldi & Wallace, 1999; Bergeron et al., 1995; Cheung, Chang, & Lai, 2000; Karahanna, Elena, Straub, & W, 1999; Limayem & Hirt, 2003; Thompson, Higgins, & Howell, 1991), particularly in predicting users' intentions or behaviors of adopting information technologies such as predicting knowledge workers' intention to use personal computers (PC) (Al-Khaldi & Wallace, 1999; Thompson et al., 1991), adoption of EIS (Bergeron et al., 1995), the World Wide Web (Cheung et al., 2000), and Virtual Communities (Limayem & Hirt, 2003).

RESEARCH MODEL AND HYPOTHESES

We thus proposed that people's behavioral intention to participate in VCs are influenced by their affect toward VCs, their perceived consequences of participating in VCs, and the social factors that influence their participation in VCs. Dependent on the type of behavior, the focus of the relationship between antecedents of behavioral intentions is different. Sometimes one of the three (affect, social factors and perceived consequences) is the strongest predictor; at other times, behavior intentions are influenced by a synergy of two or all three of them. We thus developed our hypotheses based on the three antecedents of behavioral intention in the Triandis model.

Affect

Defined as one's emotional feeling toward the behavior, affect appeared in several fields such as consumer behavior (Andrade, 2005) and social psychology (Boyd & Wandersman, 1991; Triandis, 1980). The affect has also been investigated widely in IS field to predict the adoption of technologies such as WWW at work and VCs (Cheung et al., 2000; Limayem & Hirt, 2003). The general conclusion from these fields showed that affect has a positive effect either toward behavioral intention or behavior.

Several studies showed that affect-intention relationship has some conditions to be strong. According to the proposition of Triandis (1980), the affect-intention relationship will be higher in private, hedonic, highly aroused, and less constrained social situations and weaker or zero in constrained and formal situations. This is well supported in previous studies that examined the affect-intention relationship in different social situations. For example, in private, informal social situations like a mother's intention to expose their infants to sunshine (Lulseged & Deste, 2002), affect was found to have a strong effect on behavioral intention. In formal situations like PC usage at work (Al-Khaldi & Wallace, 1999; Thompson et al., 1991), Internet and World Wide Web usage at work (Cheung et al., 2000), and use of web-based courseware (Limayem & Hirt, 2003), affect was found to have a weaker or zero relationship on behavioral intention.

Making a close examination on the social situation provided by VCs, it may be found that the social situation here is private, personal, and informal and has no clear norms (Bakardjieva, 2003; Gupta & Kim, 2007; Rheingold, 2000). One of their motivations for participating in VCs is provided by their emotional system, which means that they participate because they can obtain the feelings of pleasure, enjoyment, and comfort. This tendency is also supported by a recent study on members' commitment toward VCs (Gupta & Kim, 2007).

Thus, based on results of previous findings and the rationale above, the following hypothesis is proposed:

H1: People's affect toward VC participation has a positive effect on their behavioral intention to participate in VCs.

Perceived Consequences

Perceived consequences are defined by Triandis (1977) as the cognitive factors or the subjective probabilities of perceive possible consequences of the behavior multiplied by the value of these consequences. Based on this definition, perceived consequences of a behavior should be the sum of the product of the consequences and the corresponding values of the consequences.

$$C = \sum_{i=1}^{n} P_{c_i} V_{c_i}$$

Where C is the value of the perceived consequences, P_{c_i} is the subjective probability that a particular consequence will follow a behavior, V_{c_i} is the value of that consequence, and n is the number of consequences that a subject perceives as likely to follow a particular behavior.

Perceived consequences are reported to have strong effect toward behavioral intention in several studies such as EIS usage (Bergeron et al., 1995), employees' PC usage (Thompson et al., 1991), Internet and World Wide Web usage at work (Cheung et al., 2000), and web-based courseware usage (Limayem & Hirt, 2003). Perceived consequences are similar to the construct of perceived usefulness in the TAM model (Davis, 1989), which is an important antecedent of behavioral intention. Thus, based on findings from previous studies, it is proposed that perceived consequences will also have a positive effect on the intention of VC participation.

H2: The perceived consequences for people's VC participation have a positive effect on their behavioral intention to participate in VCs.

Social Factors

Social factors are defined as an individual's internalization of the reference group's subjective culture, and specific interpersonal agreements that the individual has made with others, in specific social situations ((Triandis, 1980). The relationship between social factors and behavioral intention is stronger in a formal and constrained social situation, or in a social situation with clearer norms (Triandis, 1980) and this is supported in formal social situations like EIS usage (Bergeron et al., 1995), employees' PC usage (Al-Khaldi & Wallace, 1999; Thompson et al., 1991), Internet / World Wide Web usage at work (Cheung et al., 2000), and web-based courseware usage (Limayem & Hirt, 2003). Accordingly, social factors will have no or even a negative effect on behavioral intention in an informal and relaxing social situation such as car choice (Bamberg & Schmidt, 2003) and mothers' behavioral intention to let their babies have sunshine (Lulseged & Deste, 2002).

 Indirectly, social factors are similar to the construct known as subjective norms—referring to the influence of social pressure that is perceived by the individual to perform or not to perform a certain behavior, in TRA (Fishbein & Ajzen, 1975) and TPB (Ajzen, 1991).

Social factors are often not included in the early technology acceptance studies in TAM model mostly because the technology studied at that time are spreadsheet or word processor that do not require the influence from social factors. However, recently, the finding especially from the social software reported that social factors played an import role in influencing behavioral intention (Gupta & Kim, 2007; Song & Kim, 2006).

Based on the findings of these previous studies, it is reasonable for us to postulate that people's behavioral intention to participation in VCs is also influenced by their social factors.

H3: The social factors of People have a positive effect on their behavioral intention to participate in VCs.

Community Interaction Effect

As proposed by Triandis, the different types of social situation have an effect on the strength of different antecedents of behavioral intention, i.e. the strength of affect-intention, social factors-intention, and perceived consequences-intention relationships may vary with different types of social situation. As each VC maybe treated a different social situation, we propose that the three types of relationships will be different across different VCs.

RESEARCH METHODOLOGY

 In this study, an online cross-sectional survey in online forums was adopted as the research method to investigate the behavior of VC members. A total of three VC companies participated in our study. These three companies were the Tencent Community, a single commercial community; the Xilu Community, a sole commercial community; and the Microsoft Chinese Community, a value-added professional community of a large software company. These three communities were selected because they are of different natures and represent three of the largest VCs in China.

Data Collection

An online questionnaire hosted in a service provider's site (http://www.my3q.com) was developed to collect data from members of the three participating VCs in China. The use of a service provider also allowed us to deal with the problems of access control, authentication, and multiple responses associated with the web-based data collection approach (Stanton & Rogelberg, 2001). The success of data collection in this study rested on the management support of the three participating VCs. Therefore, the management of all participating VCs was contacted to obtain their support for our survey.

Variable Operationalization

The variables in the Triandis model were operationalized according to the initial suggestion of Triandis and previous studies. The measure of behavioral intention was adapted from Davis (1989), Davis et al. (1989), Moon and Kim (2001), and Teo et al. (1999). The measure of affect was adapted from Triandis (1980), who suggested the use of four pairs of semantic differential items—pleasant-unpleasant, enjoyable-disgusting, exciting-depressing, and joyful-hateful. Perceived consequence was measured by the construct developed by Limayem and Hirt (2003) in their study of WebBoard for supporting Internet communications. Social factors were measured using two approaches. First, we adapted some of the items from previous studies (such as (Baumann, Brown, Fontana, & Cameron, 1993; Limayem & Hirt, 2003)). Second, we used open questions to solicit additional information on the social factor. This method has been used by Limayem and Hirt (2003) to develop environment-specific factors with great success.

Instrument Validation

To ensure the validity and reliability of the questionnaire, a four-stage survey validation was conducted. First, whenever possible, previously validated questions were used, and generally accepted online instrument construction guidelines

(Ridings, Gefen, & Arinze, 2002; Stanton & Rogelberg, 2001; Wang & Fesenmaier, 2003) were observed as much as possible. Second, the questionnaire was back-translated to ensure the validity of the language usage. Third, the questionnaire was pretested by one MIS professor, seven business doctoral students, and two experienced VC webmasters. Forth, a pilot test for the questionnaire was conducted on two small VCs.

Data Analysis

SPSS 14.0 and Lisrel 8.7 were used to analyze all data collected. Confirmatory Factor Analysis (CFA) was used to check the fitness of data for our research model. Finally, Structural Equation Modeling (SEM) was conducted to validate and test the research models proposed in this study.

RESULTS

In this research, a total of 1,406 responses were collected from the three participating communities. After checking for data integrity, we eliminated seventy-six responses suffering from multiple responding problems and eighteen from ineffective response problems, thus giving us a total of 1,312 effective responses.

Profile of Respondents

Of the 1,312 valid responses, 98% were from Mainland China, Hong Kong, Macau or Taiwan. Most respondents were male (75%) and single (78.7%). Their occupations varied from unemployed to professionals, with most of them being engineers/computer technicians and students. Regarding their ages, the respondents were predominately (67.9%) in the range 19-28. As for their education level, more than half of them (72.3%) were college graduates. The profile of our respondents is very compatible to the VC profiles announced in the official site of CNNIC1 (China iNternet Network Information Center), thus suggesting that our respondents were representative of VC users as a whole.

Descriptive Statistics and Reliability

The descriptive statistics and Cronbach's Alpha were reported in table 1. As indicated in Table 1, the Cronbach's alpha values of all our variables are above 0.80, significantly above the 0.7 level suggested for exploratory research, thus supporting the reliability of our measurements for model testing.

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[1] http://www.cnnic.net.cn/index/0E/00/11/index.htm

Construct	Mean	S.D.	Cronbach's Alpha
Behavioral Intention (BI)			
BI1	5.41	1.49	
BI2	4.96	1.60	0.80
BI3	4.89	1.60	
Affect			
AFF1	5.17	1.47	
AFF2	5.22	1.48	0.84
AFF3	4.75	1.61	
AFF4	4.49	1.60	
Perceived Consequences (PC)			
PC1	4.16	1.79	
PC2	3.79	1.78	
PC3	3.49	1.67	0.88
PC4	3.21	1.64	
PC5	3.43	1.65	
PC6	2.79	1.65	
Social Factors (SF)			
SF1	5.12	1.62	
SF2	5.01	1.52	0.87
SF3	4.85	1.61	
SF4	4.92	1.71	

Table 1. Descriptive statistics and Cronbach's Alpha

Analysis of Measurement and Structural Model

Lisrel 8.70 was conducted to assess the measurement and structural model of Triandis for its fitness in our study. The values of our measurement and structural model, along with the recommended values, are reported in Table 2. Overall, our measurement model and structural model suggest an acceptable level of fit.

Community	χ^2	df	NNFI	CFI	IFI	GFI	AGFI	SRMR	RMSEA
Recommended Value			≥0.90	≥0.90	≥0.90	≥0.80	≥0.80	≤0.11	≤0.10
Measurement Model	1136.28	84	0.95	0.96	0.96	0.87	0.82	0.053	0.11
Structural Model	1136.28	84	0.95	0.96	0.96	0.87	0.82	0.053	0.11

Table 2. Results of measurement and structural model

The overall explanatory power of the Triandis model was examined using the R^2 and the individual path coefficients, which was reported in figure 1 with their respective level of significance. As shown in Figure 1, all the three hypotheses are significant.
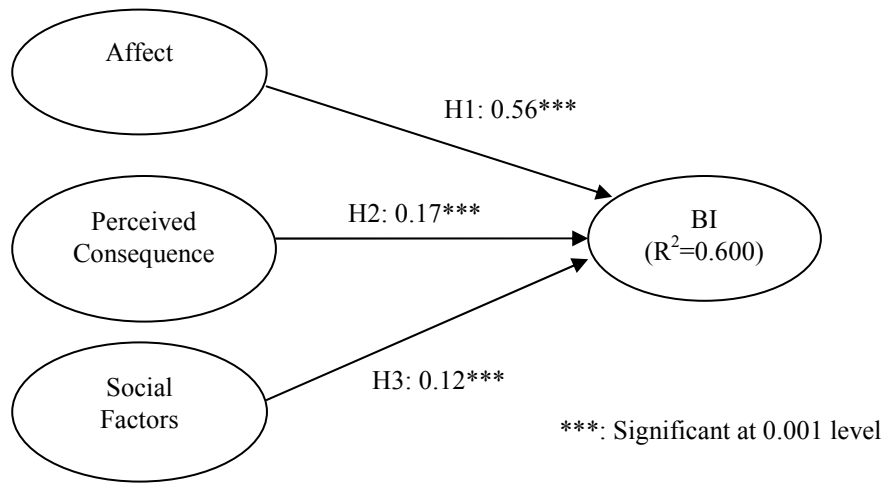
Figure 1. Result of Triandis Model Testing

Because the data was collected from three different VCs, the model was also tested across the three communities reported in Table 3. It is interesting to notice that the relationships are different across different communities, which is consistent with our initial proposition.

Hypothesis	Effect Size			
	Combined	Tencent	Xilu	Microsoft
H1. Affect→BI	0.56***	0.43***	0.36***	0.70***
H2. PC→BI	0.17***	0.38***	0.29**	-0.06
H3. SF→BI	0.12***	0.01	0.17***	0.23***
R Square of BI	60%	59%	53%	68%

Table 3. Hypotheses across the community *** Significant at the 0.001 level ** Significant at the 0.01 level

DISCUSSIONS AND CONCLUSIONS

The findings in this study confirm that the three antecedents of behavioral intention—affect, social factors, and perceived consequences—all have positive effects on behavioral intention with different strength. Of the 60% variance of behavioral intention accounted for by these three antecedents, affect has the largest effect (effect size 0.56) and social factors have the least effect (effect size 0.12). These results imply that when members feel pleasurable, when they feel that the value of perceived consequences of participating in VCs is high, and when their friends, colleagues, and other social forces think they should participate in VCs, their intention to participate in VCs will be higher.

One of the most interesting parts of the Triandis model is the different strength of the relationships of affect, perceived consequences, and social factors on behavioral intention under the different social situations studied, which is remarkably evident in the result of this study. The result for the effect of affect on behavioral intention aligns with Triandis's initial proposition that affect will have the largest effect on behavioral intention in private, hedonic, highly aroused and less constrained social situations (Triandis, 1980). Compared to other environments such as PC usage at work (Thompson et al., 1991), EIS usage (Bergeron et al., 1995), and Internet / World Wide Web usage (Cheung et al., 2000), the VC environment is an informal, unconstrained, and relaxed environment. Thus, the affect is expected to have the largest effect on behavioral intention.

The result from this study has important implication to both researcher and VC organizer. For researchers, this study provide a starting point to investigate the antecedents of behavioral intention to participate in VCs and the community's effect on different strength of relationship also shed light on the VC study area. For VC organizer, the three factors identified in this study may serve a theoretical guidance for them to both build and operate VCs.

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