Information Privacy and Loneliness on the Impact of Virtual Communities Users’ Voice

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ABSTRACT

One motivation for virtual communities users is to interact with less familiar community members. This is known as the weak tie concept. Previous studies are based on utilitarian and hedonic aspects for virtual communities in the past, but few researches focus on the personal factors. In the context of virtual communities, this study takes information privacy and loneliness for the exogenous variables, through self-disclosure intermediary, to explore the impact on the virtual communities users’ voice. To apply of structural equation modeling analysis, this study shows that (1) Users’ general privacy concern has a significant and negative effect on self-disclosure and privacy protection belief has a significant and positive effect. (2) Only romantic loneliness negatively affects users’ self-disclosure in virtual communities. (3) Self-disclosure amount and self-disclosure depth have significantly positive affect on voice. Keywords: Virtual Communities, Information Privacy, Loneliness, Self-disclosure, Voice

INTRODUCTION

Without distinction, just add in virtual communities, everyone can freely voice. Revolutionary changes in online social software and systems have transformed interpersonal interactions from physical contacts into virtual online gatherings. The use of virtual communities has become a greater part of people’s lives. This phenomenon indicates that users perceive virtual communities as crucial media for managing interpersonal relationships. Users of virtual communities no longer require substantial financial resources to exhibit discursive power or voice their opinions; instead, only the ability to operate a computer is necessary (Chittenden, 2010; Mitra, 2002; Zhao and Rosson, 2009). This has provided disadvantaged groups in society with the opportunity to express their thoughts and feelings in the virtual environment and connect with society (Chen, 2012; Nardi, Schiano and Gumbrecht, 2004).

Recently thriving community site, on behalf of the user's profile increasing openness, privacy issues are more attention. On the contrary, the general information privacy concerns will reduce the use of virtual communities and the extent of self-disclosure. When the capacity of community sites to protect users, vendors can provide stronger privacy of personal information, the user is able to enhance the community's self-disclosure level of the site (Li, Sarathy and Xu, 2011; Stutzman, Capra and Thompson, 2011).

Previous studies on emergent information technology have emphasized the utilitarian (Hossain and de Silva, 2009; Huang and Lin, 2011) and hedonic aspects (Chang and Zhu, 2011; Lin and Lu, 2011; Shin and Shin, 2011). But, few studies have examined users’ personal characteristics, such as the psychological status and emotions (Ryan and Xenos, 2011). So a high degree of loneliness tended to feel for social networking site and entertainment as an information tool to contact friends, communication, access to information and intelligence and funny silly distraction (Ong, Chang and Wang, 2011; Whitty and McLaughlin, 2007), reducing their loneliness (Bardi and Brady, 2010).
To voicing their opinions, online communication between users of virtual communities involve high levels of self-disclosure. Relevant literatures have indicated that positive self-disclosure is a crucial antecedent that effectively enhances friendships (Bane, Cornish, Erspamer and Kampman, 2010; Park, Jin and Jin, 2011; Valkenburg and Peter, 2007). And users to read messages of other members in the community, sharing knowledge and expose the community to participate in the process of self-message, the network formed between community members have mutual attention and generate a sense of belonging to each other's feelings (Chavis, Hogge, McMillan and Wandersman, 1986).

This study constructs a research model based on the foregoing researches, the user's information privacy and loneliness as exogenous variables, through self-disclosure, and users of virtual communities continued voice as outcome variable. Therefore, in the context of virtual communities, the objective of this study is to explore the effects of self-disclosure and continuous voice antecedents.

**LITERATURE REVIEW**

**Virtual Communities**

Facebook has become the most popular virtual communities platform in the world. Anyone can join Facebook and build a personal profile to share personal information, photographs, and videos with friends. Facebook users can also join groups formed by other members to create opportunities for mutual exchanges and interactions. In addition, users can join fan pages to express their interests in organizations, celebrities, sports clubs, or gourmet foods. This enables group members with the same interests to congregate (Hew, 2011). Regarding the hedonic aspect, various applications supported by Facebook, such as games and psychological tests, provide users with psychological pleasure and relaxation.

**Information Privacy**

April 2013 Social Bakers published statistics pointed out that there have recently been more and more users concerned about privacy could not be maintained, or the fear of Internet addiction, simply start disable, delete Facebook account action. Therefore, concerned about privacy leaks deactivated Facebook is definitely one of the people than the fear factor. When people engage in various online activities, they typically disclose amount of personal information to strangers. Consequently, providing an adequate and highly private online environment is a crucial factor for the continuing survival of virtual enterprises (Chung, Park, Wang, Fulk and McLaughlin, 2010; Son and Kim, 2008).

Exploring the factors that influence consumer disclosure of personal information to online vendors, Li et al. (2011) divided privacy into a person’s general privacy concern and privacy protection belief regarding a specific vendor. They found that both aspects were major antecedents for predicting personal information disclosure. Consequently, this study adopted the same perspective, dividing privacy into general privacy concern and privacy protection belief. General privacy concern refer to a person’s general concern of information privacy, which are not limited to a specific website or IT tool. General privacy concern refer to the degree of caution exhibited toward the potential risks of using the Internet (Malhotra, Kim and Agarwal, 2004). Privacy protection belief refer to people’s subjective perceptions of specific online vendors’ ability to protect users’ personal information. Browsing and sharing information on websites involves high levels of personal information transmission and exposure. Therefore, online vendors’ protection of users’ personal information affects users’ level of trust in the website (Chung et al., 2010; Li et al., 2011; Metzger, 2004). Research regarding user decisions to reveal personal information to online vendors has shown that when users first visit a website, or if they are unfamiliar with a website,
strong general privacy concern weaken the users’ privacy protection belief regarding the particular online vendor (Li et al., 2011; Smith, Milberg and Burke, 1996). Based on the aforementioned literatures, this study proposes the following hypothesis:

**H1:** Users’ general privacy concern has a significant and negative effect on their privacy protection belief.

**Loneliness**

Loneliness refers to the psychological distress and negative feelings people experience from their subjective dissatisfaction regarding interpersonal relationships, and is occasionally accompanied by depression, isolation, and negative behavior (Schmidt and Sermat, 1983). People with a high degree of loneliness tend to use the Internet or social software as a tool for entertainment and maintaining relationships. This involves contacting friends, communicating, obtaining information and news considered interesting, and eliminating boredom (Ong et al., 2011; Whitty and McLaughlin, 2007), thereby reducing loneliness (Bardi and Brady, 2010). In real life, excessive use of the Internet alienates people and hinders their social interactions, further intensifying their loneliness (Moody, 2001; Ryan and Xenos, 2011). Excessive Internet use can even affect people’s actual social behaviors with others (Odaci and Kalkan, 2010).

DiTommaso and Spinner (1993) developed the concept of loneliness into the Social and Emotional Loneliness Scale for Adults (SELSA), which divides affective loneliness into romantic loneliness and family loneliness. For various subjects and in different contexts, social, family, and romantic loneliness can reflect people’s actual psychological state. This study divides loneliness into social, family, and romantic loneliness. Each dimension represents the distress and negative feelings resulting from users’ subjective dissatisfaction regarding their social, family, and romantic relationships. This differentiation between dimensions is expected to facilitate comprehensive interpretations of people’s psychological state of loneliness.

**Self-disclosure**

In the environment of virtual communities, user self-disclosure is a behavior that maintains and develops interpersonal relationships. Self-disclosure refers to a two- or more person situation in which one person plans to deliberately disclose certain personal information or thoughts to another person. Scholars have considered self-disclosure as a single dimension or multiple dimensions according to various research subjects. However, regarding the self-disclosure of virtual communities, Hollenbaugh (2010) indicated that the amount and depth of self-disclosure are influenced by gender, personality, and the satisfaction of various utilitarian and hedonic objectives. Based on this hypothesis, this study divides self-disclosure into the amount and depth of self-disclosure.

For vendors of virtual communities, if they can provide more privacy protection mechanisms that provide users anonymity, users’ willingness to candidly self-disclose can be enhanced (Tu, 2002). The greater users’ general privacy concern toward a website are, the less personal information they are willing to disclose on that particular website. The higher the perceived level of information protection provided by a website, the more users are encouraged to self-disclose on the specific website (Li et al., 2011; Stutzman et al., 2011). Based on the aforementioned literatures, this study proposes the following hypotheses:

**H2a:** General privacy concern has significant and negative effect on self-disclosure amount.

**H2b:** Privacy protection belief has significant and positive effect on self-disclosure amount.
**H3a:** General privacy concern has significant and negative effect on self-disclosure depth.

**H3b:** Privacy protection belief has significant and positive effect on self-disclosure depth.

Users with a high degree of loneliness often have poor interpersonal relationships, they converse less when interacting with people in society, and the topics of conversation are typically conventional. However, such users are generally willing to express themselves using other media (such as writing or online tools) (Davis and Kraus, 1989; Hollenbaugh, 2010) to compensate for deficiencies in real-life interpersonal interactions. In an online instant communication or virtual community context, when users experience loneliness, they desire to initiate interactions with friends, which considerably influences the amount and depth of their online self-disclosure (Hollenbaugh, 2010; Ma and Leung, 2006; Valkenburg and Peter, 2007). Based on the aforementioned literatures, this study proposes the following hypotheses:

**H4a:** Social loneliness has a significant and positive effect on self-disclosure amount.

**H4b:** Family loneliness has a significant and positive effect on self-disclosure amount.

**H4c:** Romantic loneliness has a significant and positive effect on self-disclosure amount.

**H5a:** Social loneliness has a significant and positive effect on self-disclosure depth.

**H5b:** Family loneliness has a significant and positive effect on self-disclosure depth.

**H5c:** Romantic loneliness has a significant and positive effect on self-disclosure depth.

**Voice**

In a virtual world, Voice refers to people’s use of the Internet to express their thoughts and opinions, which enables them to be heard by others (Mitra, 2002). Mitra and Watts (2002) examined the discursive power of disadvantaged groups and asserted that the Internet provides a platform and space for socially marginalized groups to exert an influence and challenge the opinions of mainstream society.

With the popularity of blogs and virtual communities, people have begun expressing their thoughts and opinions by disclosing information. In addition to writing blog posts, bloggers also use pictures and animations to attract and appeal to visitors, thereby promoting a positive response from people who browse the blog. This provides bloggers with not only a certain level of influence, but also sense of satisfaction from the recognition of others (Hollenbaugh, 2010; Lenhart and Fox, 2006; Miura and Yamashita, 2007; Nardi et al., 2004). Exploring women’s motivations for using personal blogs, Chen (2012) indicated that people with substantial self-disclosure needs tend to view blogging as a method for self-expression. In addition, Chittenden (2010) found that adolescents enjoy commenting and writing in virtual communities, and are unafraid to disclose personal information. Furthermore, adolescents can express their true selves in virtual communities, and obtain the recognition and praise of others. Based on the aforementioned researches, this study proposes the following hypotheses:

**H6a:** The self-disclosure amount has a significant and positive effect on voice.

**H6b:** The self-disclosure depth has a significant and positive effect on voice.

**RESEARCH METHODS**

The study framework, operational definitions, and measurement items were established based on theoretical foundations adopted following the literature review. Online questionnaires were used to collect data for quantitative data analysis and research hypotheses validation.
**Research Model**

Based on literature review, this study divided information privacy, loneliness and self-disclosure into multiple dimensions in the research model. Loneliness is divided into social, family and romantic loneliness, while information privacy is divided into general privacy concern and privacy protection belief. With two dimensions of self-disclosure, self-disclosure amount and self-disclosure depth, to construct a research framework investigates the effect of continued voice behavior. Figure 1 shows the research model.

![Figure 1: Research model](image)

**Measures**

The information privacy scale having two dimensions as general privacy concern and privacy protection belief are from Li et al. (2011). The scales for the loneliness divided into three dimensions as social loneliness, family loneliness, and romantic loneliness are from Cramer, Ofosu and Barry (2000). The self-disclosure scale having two dimensions as self-disclosure amount and self-disclosure depth are from Pornsakulvanich, Haridakis and Rubin (2008). The voice scale has five items developed by Chen (2012).

**ANALYSIS AND RESULTS**

**Data Collection**

The population of this study are people who have used Facebook in Taiwan. Hewson, Yule, Laurent and Vogel (2003) implied that the Internet questionnaire does not deviate the traditional random sampling questionnaire method. Therefore, this study using mySurvey network questionnaire services to collect data and questionnaires placed in NTU PTT electronic bulletin board (Telnet://bbs.ptt.cc) and Facebook network sites. 1065 samples of the questionnaire were obtain. The invalid samples such as inconsistency,
missing, incomplete, and not provided basic personal information were screened out. The valid samples were 354 so that the respondent rate was 33.2%.

Regarding sample structure, respondents basic personal information section indicated male (60.45%); age of 16 to 24 years old (36.44%), followed by 25 to 34 years old (34.18%); educational background, the college or university (68.64%), followed by postgraduates (22.88%); place of residence, the northern (54.80%), followed by the southern (26.60%); the daily average time to access Internet of 4 to 6 hours (55.40%), followed by 7 to 9 hours (19.20%); Occupation section, student (41.81%), followed by the information technology sector (20.06%). Overall, the study sample, more men than women, with 16 to 34 year-old based, the college or university level and above, the average time spent online per day to a maximum of 4 to 9 hours.

Reliability and Validity Analysis

In this study, structural equation modeling was applied and the two-stage approach recommended by Anderson and Gerbing (1988) was adopted. First, the measurement model was analyzed by confirmatory factor analysis. All the factor loading of measurement items are greater than 0.5 and the Cronbach's α coefficient of each construct in Table 1 ranged between 0.822~0.954, which meet the threshold value 0.7 recommended by Nunnally (1978). It indicates that the measurement items of each construct has internal consistency.

| Table 1: Correlation matrix for measurement scales, cronbach’s α, CR and AVE |
|-----------------|---|---|---|---|---|---|---|---|---|---|
| Constructs SL FL RL GPC PPB SDA SDD VOC CR AVE |
| SL 0.858        |   |   |   |   |   |   |   |
| FL 0.367*** 0.849 |   |   |   |   |   |   |   |
| RL -0.078       | -0.294*** | 0.883 |   |   |   |   |   |
| GPC -0.238*** -0.182*** 0.074 0.781 |   |   |   |   |   |   |   |
| PP 0.342*** 0.283*** -0.183*** -0.260*** 0.739 |   |   |   |   |   |   |   |
| SDA 0.390*** 0.291*** -0.226*** -0.328*** 0.426*** 0.795 |   |   |   |   |   |   |   |
| SDD 0.371*** 0.262*** -0.224*** -0.342*** 0.438*** 0.571*** 0.773 |   |   |   |   |   |   |   |
| VOC 0.365*** 0.241*** -0.117*-0.223*** 0.423*** 0.515*** 0.480*** 0.719 0.842 |   |   |   |   |   |   |   |
| Cronbach’s α 0.916 0.925 0.954 0.822 0.884 0.830 0.880 0.842 |

Note: SL: Social Loneliness; FL: Family Loneliness; RL: Romantic Loneliness; GPC: General Privacy Concern; PPB: Privacy Protection Belief; SDA: Self-disclosure Amount; SDD: Self-disclosure Depth; VOC: Voice; CR: Composite Reliability; AVE: Average Variance Extracted; p < 0.05; **p < 0.01; ***p < 0.001.

The composite reliability of each construct ranged between 0.824~0.955, greater than 0.7, demonstrating a reasonable degree of internal consistency between the measurement items of each construct (Hulland, 1999). The average of variance extracted ranged between 0.517~0.779, greater than 0.5, indicating convergent validity for each construct (Fornell and Larcker, 1981). For the discriminant validity, Gaski and Nevin (1985) proposed that the correlation coefficient of any two constructs is less than the square root of the AVE of each construct, indicating discriminant validity existence. This study shows each construct has good discriminant validity.

Structural Model

This study used AMOS software to conduct structural equation modeling analysis, the overall model of fit measure of $\chi^2 = 820.040$, df = 570, $\chi^2$/ df = 1.439, GFI = 0.886, AGFI = 0.867, NFI = 0.914, NNFI = 0.905, CFI = 0.972, IFI = 0.972, PGFI = 0.758, PNFI = 0.827, RMSR = 0.082 and RMSEA =
Where GFI and AGFI slightly lower than Hair Jr., Black, Babin and Anderson (2010) proposed 0.9 standard, but according to Jöreskog and Sörbom (1993) suggests that ranged from 0.80 to 0.89 range is still reasonable fit. Overall, except RMSR slightly below standard, the rest indicators are reached within the standard. In this study, proposed models fit the overall pattern.

This study analyzes the path shown in the Figure 2, in addition to the hypothesis 4c and 5c romantic loneliness have significant negative influences on both self-disclosure amount and self-disclosure depth (path coefficients were -0.112 and -0.127, respectively) rather than significant positive influences and hypothesis 4b and 5b family loneliness is not significant positive impact on self-disclosure amount and self-disclosure depth (path coefficient 0.093 and 0.032), above four hypotheses were not supported, the remaining hypotheses are all supported.

**Figure 2: Path analysis results**

**CONCLUSION**

This study based on the results of literature review, information privacy, loneliness and self-disclosure were integrated into the research framework. These factors were employed as antecedents to examine their effects on users’ voice in virtual communities. According the results, this study proposes the following discussion, academic and practical managerial implications as a reference for various industries and fields.

**Discussion**

A path analysis of the research validation results is shown in Figure 2. In the personal factors, the path coefficients of the constructs that substantially affect the amount and depth of self-disclosure can be ordered as follows: privacy protection belief (0.369 and 0.358) and social loneliness (0.271 and 0.225). Loneliness and information privacy possess explanatory power of 44.2% and 38.0% for the amount and
depth of self-disclosure, respectively. However, Hypotheses 4c and 5c were not supported. Ryan and Xenos (2011) asserted that Facebook users are typically extroverted and narcissistic, rather than serious and socially lonely. Empirical evidence shows that the intensity of social and family loneliness experienced by users exerts significant and positive effects on the amount and depth of self-disclosure in virtual communities. However, regarding Hypothesis 4b and 5b, family loneliness did not exert significant and positive effect on self-disclosure amount and self-disclosure depth. Gentzler et al. (2011) reported that college students using virtual communities to connect with family were afraid that privacy breach between friends may cause conflicts in their families relationships. The functions and primary interfaces of emergent virtual communities emphasize designs that facilitate the making of friends. Thus, Facebook users with a high degree of family loneliness typically use the telephone or other traditional methods to maintain their families relationships, rather than using virtual communities.

The path coefficients of the amount and depth of self-disclosure in relations to voice were 0.527 and 0.245, respectively. The explanatory powers of self-disclosure for voice is 44.3%, respectively. Additionally, self-disclosure amount had the greatest influence on voice. This indicates that Facebook users employ self-disclosure amount to obtain the collective recognition of the online community toward the disclosed content and to express their opinions.

By summarizing these results, information privacy and loneliness of Facebook users are crucial antecedents that predict users’ self-disclosure on virtual communities. The mediation of the amount and depth of self-disclosure allows users to achieve voice.

**Academic Managerial Implications**

This study constructed a research framework for information privacy and loneliness of personal factors, self-disclosure and voice of behavioral factors. This framework contributes to achieving a detailed explanation of the factors that influence virtual communities’ voice.

This study divided information privacy in personal factors into general privacy concern and privacy protection belief (Li et al., 2011; Malhotra et al., 2004) to confirm the causal relationship between general privacy concern and privacy protection belief and validate the effects that the multiple dimensions of information privacy exert on users’ self-disclosure behaviors (amount and depth). The research data obtained in this study indicated the following: (a) general privacy concern in information privacy negatively influence self-disclosure, and privacy protection belief positively influence self-disclosure; (b) the stronger users’ general privacy concerns are, the more their levels of trust toward Virtual communities privacy protection are reduced. This suggests that the factors of information privacy are mutually influential. These results differ from those reported by previous literatures, which explored information privacy as a single dimension (Chung et al., 2010; Hoadley, Xu, Lee and Rosson, 2010; Shin, 2010; Son and Kim, 2008; Tu, 2002). In addition, Most previous studies have considered the loneliness of personal factors as one dimension (Hollenbaugh, 2010; Ma and Leung, 2006; Valkenburg and Peter, 2007). However, this study considered that weak-tie relationships exist between virtual communities and various user types, and divided loneliness into social, family, and romantic loneliness by referencing DiTommaso and Spinner (1993). These categories were used to validate and interpret the effects that various dimensions of loneliness in personal factors exert on virtual communities self-disclosure (amount and depth) from friendship, family, and romantic perspectives. The results show that only social loneliness positively affects users’ self-disclosure on virtual communities. However, only romantic loneliness negatively affects self-disclosure behavior. These results indicate that in the virtual communities context, loneliness must be divided into multiple dimensions.
Most previous studies on virtual communities usage focused on the utilitarian and hedonic aspects of technology use objectives, without considering interpersonal and social factors (Chen, 2012). By contrast, this study considered that the purpose of establishing virtual communities is to promote interpersonal interaction, and voice as the purposes of use in the interpersonal dimension. The empirical results showed that the self-disclosure amount exerted the greatest influence on users’ voice. This indicates that continued use of Facebook to express opinions and share feelings is the primary means for users to achieve their purposes of use.

**Practical Managerial Implications**

By exploring the personal factors that influence users’ self-disclosure on Facebook, this study found that information privacy and loneliness are crucial antecedents. The results indicate that high levels of social loneliness positively increase users’ self-disclosure. Thus, most frequent virtual communities users possess certain levels of social loneliness. This study also shows that the most crucial antecedent influences users’ self-disclosure is social loneliness. Therefore, vendors of virtual communities should provide additional online video interactions for users who desire social interaction to increase the frequency with which users log onto the website.

Regarding information privacy, the results indicate that users’ privacy protection belief related to virtual communities is a crucial factor that influences their self-disclosure. A real-name requirement was recently adopted for the Facebook registration process, which indicates that any change in users’ lives may be actively or passively exposed to the public. Facebook should provide additional online security measures with strict browsing privileges to prevent the leakage of personal information to the third parties without user authorization. These measures can increase users’ trust. The results obtained in this study also highlight the risks of personal information leakages resulting from the popularization of Facebook. Therefore, vendors of virtual communities should employ caution and provide security mechanisms to prevent privacy breaches. The establishment of solid privacy protection belief can encourage active use among members.

To achieve the objectives of maintaining relationships with others, and expressing thoughts to others, users of virtual communities employ self-disclosure, which thereby increases their future intentions to voice. Facebook features functions that allow users to frequently and conveniently engage in exchanges involving strong and weak ties. Furthermore, Facebook provides users with the space and means to express their opinions and creativity. This is the primary reason for Facebook’s sustained popularity among users. In addition, rather than encouraging members to use the website to share and disclose personal information with others, vendors for virtual communities should aim to increase the frequency with which users actively employ Facebook to express their opinions and creativity. This is the crucial factor for effectively enabling people to maintain relationships and to voice their thoughts.

**Biographical Notes about the Author**

Tien-You Chiu obtained his PhD from the Department of Business Administration of National Dong Hwa University, Taiwan. He is an Assistant Professor at Dahan Institute of Technology in Taiwan. His research is interest in Marketing Research, Marketing Management, Consumer Behavior, E-Commerce, Human Behavior in Computer and Virtual Community, Quality Management, and Customer Satisfaction.
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