
Influence of Social Presence on Sense of Virtual Community

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Virtual Internet communities have emerged that feature cross-platform, interactive, diversified, and personalized functions, enabling members to share ideas, interests, information, feelings, knowledge, and experiences with other members in a lifelike environment. In this study, we investigated how a sense of virtual community is formed in the online environments where users communicate and build interpersonal relationships. We adopted a questionnaire survey method, selecting Wretch users as the study participants. We analyzed 196 valid questionnaires using structural equation modeling. The results revealed that a positive relationship existed between social presence and sense of virtual community and between naturalness (an element of social presence) and membership status, community support, and sense of attachment (elements of sense of virtual community). Objectivity (an element of social presence) only exhibited a positive relationship with membership status and community support (elements of sense of virtual community). According to these results, we offered a reference for future studies.

Keywords: social presence, sense of virtual community, Wretch

Introduction

In recent years, the rapid growth of broadband Internet has prompted the accelerated growth of Internet users and the diversified development of the Internet. According to year-end statistics prepared by the Institute for Information Industry (III) for 2013, 6.73 million people subscribed to cable broadband Internet in Taiwan, 19.29 million people subscribed to mobile Internet, and more than 11 million people regularly used the Internet, yielding a penetration rate of 84.8%.^[1] Following the most distinctive change has been the emergence of virtual Internet communities that feature cross-platform, interactive, diversified, and personalized functions, and which provide a novel environment where users can communicate and build interpersonal relationships, share ideas, interests, information, feelings, knowledge, and experiences with other users.^[2]

In addition, the popularity of the Internet has contributed to the rise of blogs. By writing in blogs, bloggers can express thoughts and feelings, transmit information, and exhibit creativity. According to Web traffic rankings survey, ^[3] Wretch blogs ranked 102 globally, and followed by Yahoo about concerning the number of members with personal blogs.^[4] The most representative social networking community of Wretch blogs originally provided free personal website platforms, but later transformed into a commercialized community website, increasing in scale and members to share experiences and information with friends and express views and thoughts in a life like environment. In this study, social presence and sense of virtual community were selected as the variables, and members of Wretch were chosen as the participants.

Literature Review

Social Presence

Social presence refers to the perception of the presence of others during the communication process^[5] and is defined as the sense of being with another person and the sense of being together. It can also be defined as the extent to which the other party is perceived as real from an interaction through a communication medium. ^[6] The social presence theory proposed by Short et al.^[7] asserts that communication media enable both parties to feel the presence of the other party and influence their interpersonal interactions.

Social presence is a vital element affecting learning satisfactions in virtual learning environment and revealed some important specifications such as feeling of social comfort, user satisfaction, participants interactions.[27] The dimensions of social presence consist of physical space, engagement, naturalness, and negative effects; naturalness exhibits a direct influence on the social presence perceived by an individual.[8] Therefore, in this study, naturalness was included as one of the dimensions of social presence.

Users feel they are in a real environment, and the “realness” of the environment is based on how much sensory information can be obtained, how well the users can control the environment, and how well they can change the environment. [9][10] These results show that objectivity is one of the crucial factors of social presence; thus, it was used along with naturalness as the dimensions of social presence in our investigation.

Sense of Virtual Community

Sense of virtual community, which signifies the collective senses of members in a community, denotes members’ perceptions of other members and the community. [11]Blanchard further declared that sense of virtual community signifies feelings such as sense of identification, sense of belonging, connection, or influence experienced by a member when interacting with other members of a community frequently visited on the Internet.[12]

In this study, we considered the various aforementioned views, dividing sense of virtual community into three dimensions: membership, community support, and sense of attachment. Membership signifies that virtual community members feel that they think similarly with other members, which fosters a sense of belonging and identification. Community support was included as the second dimension of virtual community. Wood and Smith further established that the concept of sense of identification and belonging is part of the definition of and review standards for virtual communities. Thus, we included sense of attachment as the third dimension of sense of virtual community. [13]

Relationships between Social Presence and Sense of Virtual Community

Social presence is one of the crucial indicators that explain the behavioral intentions of users as they become involved in virtual reality and online

community environments. [14][15][16][17] In the other, McMillian and Chavis[18] and Greer[19] have asserted that sense of community encompasses sense of identification and perception of influence. Sallnas[5] claimed that social presence is correlated with sense of being with another person. We proposed that a positive relationship exists between social presence and membership status.

Hanson[20] indicated that online communities exhibit four characteristics, one of which is the mutual support between groups within the communities that communicate through a distal environment (i.e., the Internet). Therefore, we inferred that the higher the social presence that is formed in distal environments, the greater is the mutual support between groups within virtual communities.

Biocca et al.[10] declared that sense of presence includes spatial presence and physical presence, both of which are the feelings of being there and being together with another person. Wood and Smith[13] included the concepts of sense of identification and sense of belonging in the definition of virtual community. Therefore, we proposed that a positive relationship exists between social presence and sense of attachment.

Lessiter et al. [8] acknowledged that naturalness is a factor for sense of presence that exerts a direct influence on the social presence perceived by individuals. Conversely, a person's perception of the objective environment may form as a result of the virtual environments and mental processes created and enabled by intermediary media. [21] In summary, in this study, we proposed the following six hypotheses that naturalness and objectivity are related to social presence.

H1: A positive relationship exists between naturalness and membership status.

H2: A positive relationship exists between naturalness and community support.

H3: A positive relationship exists between naturalness and sense of attachment.

H4: A positive relationship exists between objectivity and membership status.

H5: A positive relationship exists between objectivity and community support.

H6: A positive relationship exists between objectivity and sense of attachment.

Research Methods and Design

Research Framework

In this study, we considered the viewpoints provided in related literature, and we proposed a research framework (Figure 1).

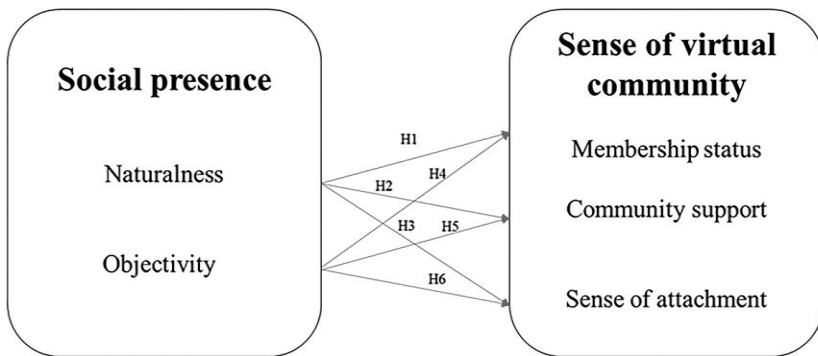


Figure 1: Research framework

Measuring the Variables

The two variables measured in this study were social presence and sense of virtual community. A 7-point Likert's scale was employed and ranged from 1 (strongly disagree) to 7 (strongly agree).

Social presence

We used the social presence scale developed by Gunawardena and Zittle.²² The scale contains 14 question items, which were used to measure the level of social presence felt by Wretch members. However, social presence scale lacks dividers that could have enabled us to separate the subdimensions. Therefore, before a formal test, a pretest of the scale was performed and exploratory factor analysis was conducted. The sample as: "The Wretch website community manager established a feeling of an online community" and "The Wretch website community manager enabled members to engage in blog discussions on the Wretch website."

Sense of virtual community

In this study, we created a sense of virtual community scale by modifying the scale developed by Blanchard [12], who created 18 questionnaire items that pertained to membership status, community support, and sense of attachment. Because Blanchard indicated that the scale cannot be divided the questionnaire items into each respective dimension. Therefore, before a formal test, we performed a pretest, using exploratory factor analysis to determine the items for each subdimension. Table 1 shows the results of our factor analysis on social presence and sense of virtual community.

Table 1: Eigenvalues for the dimensions of social presence and sense of virtual community obtained after extraction and varimax rotation

Factors	Eigenvalues after extraction			Eigenvalues after varimax rotation		
	Eigenvalue	Explained variance	Cumulative explained variance	Eigenvalue	Explained variance	Cumulative explained variance
Social presence						
Naturalness	4.027	33.56%	33.56%	3.359	28.00%	28.00%
Objectivity	2.249	18.74%	52.30%	2.916	24.30%	52.30%
Sense of virtual community						
Membership	6.665	41.66%	41.66%	4.766	29.79%	29.79%
Community support	2.015	12.60%	54.25%	3.449	21.56%	51.35%

Study Participants and Sampling

According to an industry analysis survey report prepared by III, among Taiwanese netizens who used blogs, those who used Wretch accounted for the highest proportion. A survey on Taiwanese consumer digital lifestyle

showed that 90.4% of netizens used Facebook and Wretch. [23] Therefore, in this study, we selected Wretch blog users as our sample participants.

Because of convenience and time concerns, we adopted the convenience sampling method to distribute the formal questionnaires. The questionnaire surveys were distributed in two manners: physically (paper-based questionnaires) and online (Internet-based questionnaires). Three selection criteria were developed to determine valid questionnaires: (a) participants who provided identical answers (reverse question items included) on most of the questionnaire were excluded; (b) participants who failed to answer more than one question were excluded (for those who failed to answer one question, an answer was at inserted at random); and (c) participants who submitted the online questionnaires from the same network address within a relatively short period of time (suggesting that they completed the questionnaires more than once) were excluded.

A total of 71 paper-based questionnaires were disseminated and 67 were returned. The number of valid questionnaires was 48. Conversely, a total of 206 Internet-based questionnaires were completed on the free online survey questionnaire platform my3q. The number of valid questionnaires was 148. These paper-based and Internet-based questionnaires were distributed to Wretch members, and the total number of valid questionnaires returned was 196.

Results of Data Analysis

In this study, structural equation modeling was adopted, and software packages SPSS 12.0 and LISREL 8.51 were used to verify our hypotheses.

Reliability and Validity Analysis

The reliability of the questionnaire signified the reliability of each questionnaire item on the questionnaire; the goal of the reliability analysis was to test whether stable reliability was observed. In this study, we used Cronbach's α , a confidence coefficient commonly used for Likert scales, as the method for assessing reliability. The eligibility criterion was .6, and an α value exceeding .5 was considered to be reliable. [24][25] Table 2 shows the results of the questionnaire reliability analysis; the two variables and their dimensions all had a confidence coefficient that was within the reliable range.

Table 2: Overall reliability of social presence and sense of virtual community

Variables	Dimensions	Cronbach's α	Reliability
Social presence	Naturalness	.81	Highly reliable
	Objectivity	.83	Highly reliable
Sense of virtual community	Membership status	.897	Highly reliable
	Community support	.822	Highly reliable
	Sense of attachment	.518	Reliable

The validity of the questionnaire signified the extent to which the questionnaire validly (effectively) measured the nature of the variables. Using the results from the pretest, we revised the wording of the questionnaire items that were unclear and confusing. Our final questionnaire exhibited favorable validity.

Concerning construct validity, the factor analysis was adopted verify the construct validity of the scales. Exploratory factor analysis and LISREL were used to modify indicators and delete questionnaire items that hindered the model from demonstrating a reasonable level of fitness. After modification, the modified scale for each construct showed favorable construct validity.

Regarding convergent validity, to determine whether questionnaire items listed in the indicator measurement tools could sufficiently represent the constructs to be measured, the *t* value was used, determining the relationship between the questionnaire items and the constructs; the convergent validity of the scale was considered valid only when the *t* value achieved the level of significance.

4.2. Verification Results of Hypotheses

4.2.1. Analysis of the overall model

Results of the various measurements of the overall model obtained using LISREL analysis are as follows: chi square value, 265.32; degree of freedom, 127; RMSEA, 0.67; GFI, .89; AGFI, .86; NFI, .87; NNFI, .91; and CFI, .93. These results indicated that the overall model exhibited favorable goodness of fit.

4.2.2. Verification of hypotheses

We used the LISREL model to verify our study hypotheses. Structural equation modeling was used to analyze the variables. According to the two charts in Figure 2 and Table 3, a significant and positive relationship (estimated value = .99, $t = 5.40$, $p < .001$) existed between naturalness and membership status, supporting H_1 ; a significant and positive relationship existed between naturalness and community support (estimated value = .80, $t = 4.75$, $p < .001$), supporting H_2 ; a significant and positive relationship existed between naturalness and sense of attachment (estimated value = .77, $t = 3.99$, $p < .001$), supporting H_3 ; a significant and positive relationship existed between objectivity and membership status (estimated value = .19, $t = 3.03$, $p < .001$), supporting H_4 ; a significant and positive relationship existed between objectivity and community support (estimated value = .19, $t = 3.14$, $p < .001$), supporting H_5 ; however, no significant and positive relationship was observed between objectivity and sense of attachment (estimated value = -.02, $t = -.30$, did not achieve significance) and thus, H_6 was not supported.

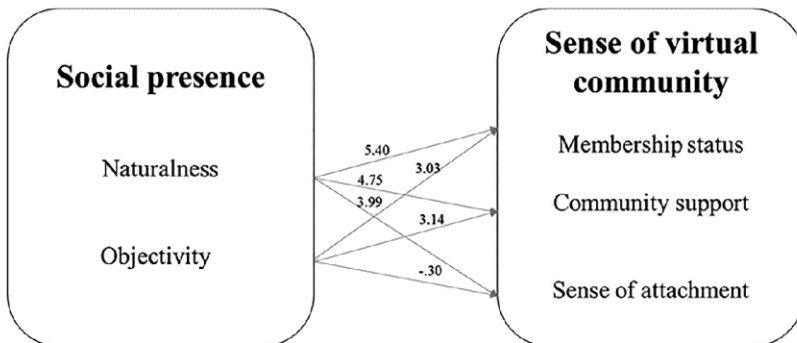


Figure 2: Analysis results of the overall model and hypothesis verification

Table 3: Hypothesis verification results (model goodness of fit)

Relationship between variables	Hypothesis	Expected result	Estimated value	t value	Result
Naturalness→membership status	H1	+	.99	5.40***	Supported
Naturalness→community support	H2	+	.80	4.75***	Supported
Naturalness→sense of attachment	H3	+	.77	3.99***	Supported
Objectivity→membership status	H4	+	.19	3.03***	Supported
Objectivity→community support	H5	+	.19	3.14***	Supported
Objectivity→sense of attachment	H6	+	-.02	-.30	Unsupported

Note ***: $p < .001$.

The verification results of the hypotheses showed that users were more likely to become a member of an online community if the community environment was natural, similar to an actual environment. In addition, the users were more willing to visit the online community frequently, a behavior that indicated they approved of the community [11] and that could be called sense of belonging. [18] Moreover, naturalness facilitated the mutual support between groups and members [11], the members' dependence on one another, and the members' sense of attachment to the website.

Concerning the objectivity of the website environment, the results showed that users were more likely to become a member of an online community if it featured an objective environment. In addition, the users were more willing to visit the online community frequently, a behavior that indicated they approved of the community [11] and that could be called sense of belonging.[18] An objective online community facilitated the mutual support between groups and members. [11]

Conclusion and Recommendations

Theoretical Contributions and Practical Implications

The first theoretical contribution of our study is the introduction of the subdimensions of social presence and sense of virtual community. During factor analysis, we explored the subdimensions of the social presence scale proposed by Gunawardena and Zittle[22] and the sense of virtual community scale developed by Blanchard. [12] We clarified information pertaining to these subdimensions that had been previously overlooked. These subdimensions can facilitate future investigations of topics concerning social presence and sense of virtual community, a contribution that emphasizes the practical value of our study.

The second theoretical contribution of this study is the verification of the relationship between social presence and the sense of virtual community. Because studies on the relationship between social presence and sense of virtual community are scant, our results can be used to fill existing gaps in the literature. By contrast, community managers of virtual communities who effectively utilize network environments and create natural and objective environments that users are willing to visit and remain in will help improve communities' operational performance.

In two practical implications, first, we propose that a high degree of social presence can effectively elicit a sense of virtual community, enabling the community to exert a strong influence. Because the Internet environment has evolved and signal bandwidths have increased, communication content dissemination has evolved from pure text to sound and still pictures. Currently, communication content also includes instant audio and video transmission, resulting in the increased social presence in network environments. [7] Some events held in virtual communities break the barriers of virtual space because they subsequently take place in real life; thus, the influence of communities no longer exists only in virtual space but also in reality.

Second, the operational performance of virtual communities can be improved by employing a network environment with a high degree of social presence. It enhances user willingness to become a member and elevates the social presence of the websites through liveliness and interaction, both of which enhance user preference and usage frequency of the websites. [26]

Therefore, for virtual community managers, enhancing the social presence of websites is essential for improving operational performance.

Research recommendations for subsequent research

A model capable of estimating the value of online virtual communities and the actual profits that these online communities are able to generate, and even of converting these estimations into gross national product (as well as economic benefits) warrants further investigation. In the other, the social presence scale developed by Gunawardena and Zittle[22] is a unified scale without subdimensions. We used an updated social presence scale that accounted for the current Internet communication and interaction environments. Such a method may be viable in future studies.

Study limitations

The first, such as limited researchers, research materials, and time, we were only able to use Wretch members as our study sample. Although all of our indicators satisfied the preset test standards according to the statistical analysis of the 196 valid questionnaires, the study results are not generalizable to all current social communities and bloggers. Second, because the period in which the participants were members of Wretch differed, their familiarity and sense of community differed, affecting the accuracy of the study results. Third, in this study, most of the information used was based on existing data analysis and questionnaire survey.

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