

Association for Information Systems

AIS Electronic Library (AISeL)

ICEB 2014 Proceedings

International Conference on Electronic Business
(ICEB)

Winter 12-8-2014

The Effect of Interactivity on SNS Users' Loyalty: Flow and Presence as Mediators

Bao Dai

Yezheng Liu

Follow this and additional works at: <https://aisel.aisnet.org/iceb2014>

This material is brought to you by the International Conference on Electronic Business (ICEB) at AIS Electronic Library (AISeL). It has been accepted for inclusion in ICEB 2014 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

THE EFFECT OF INTERACTIVITY ON SNS USERS' LOYALTY: FLOW AND PRESENCE AS MEDIATORS

Bao Dai, Hefei University of Technology, China, daibaohfut@126.com
 Yezheng Liu, Hefei University of Technology, China, liuyezheng@hfut.edu.cn

ABSTRACT

According to the stimulus–organism–response (S–O–R) paradigm, this study aims to understand how interactivity affects SNS users' loyalty through user experience of presence and flow. Data collected from 242 respondents was analyzed with structural equation modeling (SEM). The results show that machine interactivity affects telepresence and flow, person interactivity affects social presence and flow, social presence affects flow and flow further affects SNS users' loyalty. In addition, telepresence has a significant effect on social presence.

Keywords: Social networking sites, interactivity, telepresence, social presence, flow experience, user loyalty.

INTRODUCTION

With the arrival of the Web 2.0 era, Social Networking Site (SNS) is experiencing rapid development around the world. In China, the number of SNS users reached 278 million in January 2014, accounting for 45 percent of the total amount of internet users [11]. SNS, as a service platform that enables users to maintain and expand their social networks, to gain and share information, and to obtain entertainment and recreation, has achieved great success, as evidenced by Facebook. However, building users' loyalty is becoming more difficult due to the intense competition among SNS platforms and new social media, such as microblogging and so on.

Previous researches have employed the expectation disconfirmation theory (e.g. [31]), the expectation confirmation model (e.g. [7]), the technology acceptance model (e.g. [38]), and the theory of planning behavior (e.g. [1]) to examine the factors affecting SNS user loyalty. These studies have verified that satisfaction, perceived usefulness, perceived enjoyment, perceived values, confirmation of expectation, subjective norm, and trust are the main factors influencing SNS users' loyalty or continuance intention. Unfortunately, little research has examined the effect of interactive characteristics of SNS and users' experiences of presence and flow on SNS users' loyalty. Therefore, we developed a research model in this research based on the Stimulus-Organism-Response (S-O-R) paradigm to explore how interactivity affects SNS users' loyalty via their presence and flow experience.

THEORETICAL BACKGROUNDS

Stimulus-Organism-Response (S-O-R) paradigm

Mehrabian and Russell (1974) [26] first presented the Stimulus-Organism-Response (S-O-R) framework in the area of environment psychology. The S-O-R framework posits that environmental cues act as stimuli that affect an individual's cognitive and affective reactions, which in turn affect the behavior. "Stimulus" is something that provokes action, such as store atmosphere and website characteristics. "Organism" refers to the individual's cognitive and affective states, such as pleasure, arousal and dominance. "Responses" include attitudinal and behavioral responses, such as approach or avoid behavior. So far, many studies have adopted the S-O-R framework to examine the relationship between characteristics of online stores or websites and user responses (e.g. [20] [30]).

Interactivity

As the key advantage of new media, interactivity is defined as "the extent to which users can participate in modifying the form and content of a mediated environment in real time" by Steuer (1992) [35]. There are two kinds of interactivity: machine interactivity (human-computer interactivity) and person interactivity (social interactivity) [19]. Machine interactivity refers to the degree to which users can control the content, timing, and sequence of communication, experience the naturalness of Web navigation, and perceive the system's response to their input. Person interactivity presents the degree of social interconnection between users and other participants in the communication process via an online medium.

Presence

Presence represents this type of virtual experience, wherein "a person fails to perceive or acknowledge the existence of a medium in his or her communication environment and responds as if he or she would if the medium were not there" [25]. Two types of presence are proposed in prior research; i.e. telepresence and social presence. Telepresence or physical presence refers to "the extent to which one feels present in the mediated environment, rather than in the immediate physical environment" [35]. Social presence, on the other hand, has been defined as "the degree of salience of the other person in the interaction" [32], or the sense of "being with others" [18].

Flow

Flow is a concept introduced by Csikszentmihalyi (1975) [12] originally. He defined it as "the holistic experience that people

feel when they act with total involvement” , characterized by concentration on the task at hand, a merging of action and awareness, a loss of self-consciousness, and a distorted sense of time, etc.[12]. Hoffman and Novak(1996) [19] defined the flow experience in a CME as the state occurring during network navigation, which is (1) characterized by a seamless sequence of responses facilitated by machine interactivity, (2) intrinsically enjoyable, (3) accompanied by a loss of self-consciousness, and (4) self-reinforcing. In the last few years, flow has been recommended as a possible metric of the online consumer experience (e.g. [21][27][37]).

RESEARCH MODEL AND HYPOTHESIS DEVELOPMENT

Following the S-O-R framework, we proposed our research model. As shown in Figure 1, this study operationalizes “stimulus” as the interactive features of SNS, “organism” as SNS users’ experience of presence and flow and “response” as SNS users’ loyalty.

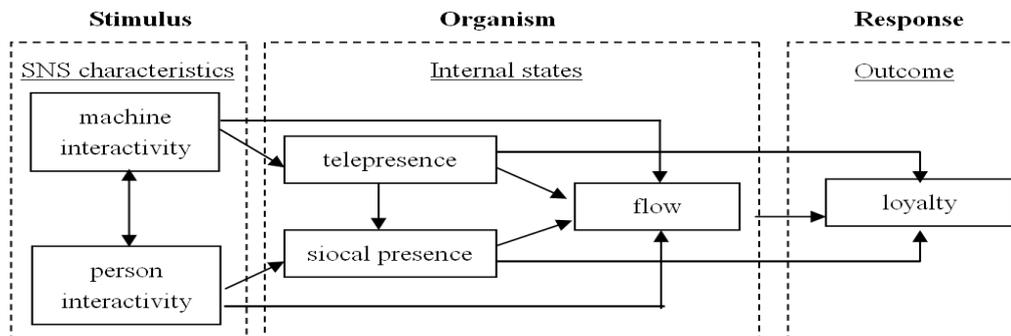


figure 1 research model

Interactivity and presence

A SNS with high machine interactivity enables users have greater sense of control over their actions and higher perceived responsiveness of the website, which facilitate SNS users develop a stronger sense of telepresence. In addition, SNS provided more and more communication tools to their users, which makes the synchronous and asynchronous interaction between SNS users become more convenient. As a result, users will be more likely to feel other communication partners are co-located within the same virtual space. So for, several studies have found the positive causal relationships between interactivity and presence [3] [30] [36]. Thus, we hypothesize that:

H1: Machine interactivity will positively affect SNS users’ telepresence

H2: Person interactivity will positively affect SNS users’ social presence

Interactivity and flow

Hoffman and Novak (1996) [19] proposed that the balance between skills and challenges and focused attention are prerequisites of flow experience. With more and more powerful interactive features and tools were developed, social interaction, information sharing, and entertainment on SNS are becoming simpler than ever, resulting in SNS users can perceive balance between skills and challenges more easily and concentration on these activities more frequently. Previous research has found the positive effects of machine interactivity and person interactivity on users’ flow experience in the context of online learning [8] [23], online gaming [6][10], and online shopping [33][37]. Recently, Huang (2012) [20] found that interactivity of SNS influences flow significantly. Consistent with these empirical studies, we propose the following hypothesis:

H3: Machine interactivity will positively affect SNS users’ flow experience

H4: Person interactivity will positively affect SNS users’ flow experience

Telepresence and social presence

Though some researchers have considered both telepresence and social presence in their studies (e.g. [3] [30] [36]), there were only several studies explored the relationship between these two variables. Suntornpithug and Khamalah (2010) [36] found telepresence has positive effect on social presence. According to the viewpoint of Biocca and Harms (2002) [5], social presence refers to the “level of awareness of the co-presence of another human, being or intelligence”, which implies that telepresence is the antecedent of social presence. Thus, we propose the following hypothesis:

H5: SNS users’ telepresence will positively affect social presence

Presence and flow

On SNS, when user experience the sense of “being there” (telepresence) and/or the sense of “being with others” (social presence), he /she may be involved in the navigation on the site more deeply. In consequence, he/she is more likely to experience flow. Telepresence was first used as an antecedent of flow experience by Hoffman and Novak (1996)[19] , and then some empirical studies verified the significant effect of telepresence on flow(e.g. [27] [34] [39]). Moreover, Faiola et al. (2013)

[14] showed that there is a significant correlation between telepresence and flow. However, there are very little literatures with regard to the effect of social presence on flow. Animesh et al. (2011) [3] found social presence influence flow positively in 3D virtual world. Shen and Khalifa (2012) [30], Hassanein and Head(2007) [16] and Cyr et al. (2007)[13] all confirmed the effect of social presence on enjoyment, which was regarded as one of the core component of flow. Thus, we hypothesize that:

H6: SNS users' telepresence will positively affect flow experience

H7: SNS users' social presence will positively affect flow experience

Presence and loyalty

As a compelling virtual experience, presence means "the natural perception of an immediate environment" [35], which is helpful to reduce the physical and social distance between SNS users. Therefore, a higher sense of presence would have a greater impact influencing individuals to join and to continue using a SNS. Shen and Khalifa (2012) [30] confirmed telepresence and social presence have a significant effect on buying impulses through the affective reactions, i.e. pleasure and arousal; Shang et al.(2012) [29] pointed out telepresence and social presence are positively associated with online purchase intentions through its influence on social and emotional value of symbolic goods; Recently, Lin et al.(2014) [24] found that social presence was strong determinant of user satisfaction and sense of belonging, which in turn positively influenced continuance intention of SNS. In addition, Cheung et al. (2011) [9] disclosed social presence is the most significantly exogenous variables of We-Intention to use a SNS. Therefore, the following hypothesis is proposed:

H8: SNS users' telepresence will positively affect users' loyalty

H9: SNS users' social presence will positively affect user' loyalty

Flow and loyalty

In the context of SNS, loyalty means a deeply held commitment to continue their usage behavior in the future. As an autotelic experience, flow is an important intrinsic motivation for performing an activity [12]. If an individual "feels good" about an activity, it is intrinsically motivating, and he/she is more likely to engage in it. For now, studies have provided enough evidences to the effect of flow on users' loyalty. For example, Koufaris (2002) [21] found that flow affects an online consumer's intention to revisit a site. Lee (2010) [22] noted that there were significant direct effects between flow and online learning retention. Chang (2013) [6], Choi and Kim (2004) [10] confirmed that online gamers' loyalty is directly influenced by their flow experience significantly. In addition, the study of Zhou et al. (2011) [40] indicated that flow experience is the strongest determinant of mobile SNS users' loyalty, and Chang and Zhu (2012) [7] also found the effect of flow experience on SNS users' loyalty was significant. Based on these, we hypothesize that:

H10: SNS users' flow experience will positively affect user' loyalty

RESEARCH METHODOLOGY

Instrument development

The research model includes six factors. Each factor was measured with multiple items. All items were adapted from extant literature to improve content validity. The items of machine interactivity and person interactivity were adapted from Suntornpithug and Khamalah (2010) [36] and Cheng (2013) [8]; The items of social presence and telepresence were adapted from Suntornpithug and Khamalah(2010)[36] and Animesh et al.(2011)[3]; The items of flow were adapted from Chang and Zhu(2012) [7]; Loyalty items were adapted from Zhou et al. (2010) [40]. All items used five-point Likert scales anchored between "strongly disagree" and "strongly agree". The Appendix shows the specific items.

Data collection

In china, 40.5 percent of SNS users are between 20 and 29 years old, 57.4 percent of them have an education at or above the college level [11]. Therefore, this empirical study used undergraduate students as subjects. At first, 20 undergraduate students majoring in business administration and registered users of SNS were chose as the seed investigators on the principle of convenience sampling. And then these seed investigators sent the e-Questionnaire of this study to their best SNS friends who must be college students. One week later, the seed investigators handed in the e-Questionnaires returned by their friends. The final effective sample size is 242. The sample consisted of 48.8% male and 51.2% female participants with the ages of 18 to 24.

DATA ANALYSIS AND RESULTS

In analyzing the collected data, we followed the two-step procedure suggested by Anderson and Gerbing (1988) [2]. First, we examined the measurement model to assess reliability and validity. We then examined the structural model to test the hypotheses.

Measurement model

To validate the measurement model, reliability and validity analyses were performed by executing exploratory factor analysis and confirmatory factor analysis together. Construct reliability was assessed by using Cronbach's alpha value. Nunnally (1978) [28] recommends that the Cronbach's alpha of a scale should be greater than 0.7 for items to be used together as a construct.

As shown in Appendix, all constructs are in the acceptable range, achieving acceptable internal consistency. Convergent validity indicates the items of each constructs are theoretically related to each. For the convergent validity, all factors should have average variance extracted (AVE) of higher than 0.50 and composite reliability (CR) higher than 0.70 [15]. As Table 1 shows, all AVE and CR values of the items are acceptable. Discriminant validity was assessed to discover whether one construct is different from another. According to Fornell and Larcker (1981) [15], discriminant validity is achieved if the squared root of the AVE for each construct exceeds the correlation between that and any other constructs. As shown in Table 1, the square roots of the AVE scores were all higher than the correlations among the constructs, demonstrate adequate discriminant validity of all constructs.

Table 1 Reliability and validity

construct	MI	PI	TP	SP	FLOW	LOY	AVE	CR	Alpha
Machine interactivity(MI)	0.807						0.651	0.882	0.820
Person interactivity(PI)	0.475	0.786					0.617	0.866	0.793
Telepresence(TP)	0.148	0.061	0.886				0.785	0.936	0.883
Social presence(SP)	0.227	0.248	0.403	0.823			0.678	0.894	0.841
Flow experience(FLOW)	0.576	0.551	0.160	0.387	0.858		0.737	0.918	0.879
Loyalty(LOY)	0.438	0.422	0.241	0.329	0.547	0.845	0.714	0.882	0.799

Note: Bolded diagonal elements are the square root of AVE for each construct, off-diagonal elements are the correlations between constructs.

Structural model

The hypotheses were tested by using the maximum likelihood estimation technique. The SEM results show that GFI (0.919), AGFI (0.894), NNFI (0.963), and CFI (0.969) all exceeded the cutoff values except NFI (0.894), while χ^2/df (1.367), RMR (0.040), and RMSEA (0.039) met the recommended threshold criteria of Bagozzi et al.(1991) [4]. In sum, the fit indices to the structural model were found to be satisfactory. Table 2 presents a summary of the analysis. Most of the hypothesized relationships were significant at $p < 0.05$. As expected, machine interactivity affects SNS users' telepresence and flow experience, providing support for H1 and H3. Person interactivity affects SNS users' social presence and flow experience, providing support for H2 and H4. Social presence has significant direct effects on flow experience, which further affects SNS users' loyalty, supporting H7 and H10, respectively. In addition, telepresence has a significant effect on social presence, supporting H5. However, the causal relationships between telepresence and flow, telepresence and loyalty, and social presence and loyalty were not significant.

Table 2 Results of hypotheses testing

Hypothesis	Path	Path Coefficient	Supported or not
H1	MI→TP	0.170*	YES
H2	PI→SP	0.251***	YES
H3	MI→FLOW	0.504***	YES
H4	PI→FLOW	0.302**	YES
H5	TP→SP	0.442***	YES
H6	TP→FLOW	0.020	NO
H7	SP→FLOW	0.248***	YES
H8	TP→LOY	0.007	NO
H9	SP→LOY	0.033	NO
H10	FLOW→LOY	0.130**	YES

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

DISCUSSION AND CONCLUSION

Interactivity influences presence and flow, which is consistent with previous findings (e.g. [3][30][36]) and indicates that the characteristics of SNS do affect SNS users' experience. Thus, the high controllability, fast responsiveness, and more sociability of SNS will significantly promote users' experience. According, SNS operators need to optimize their back-end systems to provide users with ease-to-use, fast responses and convenient services.

Surprisingly, the effect of telepresence on flow is not significant. This result is not consistent with previous findings [14] [27][34][39]. The reason could be that telepresence is more likely to be experienced in the context of virtual reality, such as 3D virtual world, but now very little virtual reality technology have been utilized by the mainstream SNSs. Consequently, it is difficult to experience the sense of physical presence in the cyberspace created by SNS. In fact, the mean of telepresence in our study is low ($M=2.461$), suggesting that most users can't experience telepresence during using SNS.

The results also showed that telepresence and social presence both have no significant direct effect on loyalty. It is possibly

because their relationship is mediated by other factors, such as satisfaction, perceived usefulness, perceived enjoyment, trust, flow, etc., as previous studies shown (e.g. [24][29][30]).

Finally, it also found social presence affects flow experience significantly, as in previous studies (e.g. [3][13][16][30]). The possible explanation is the powerful sociability of SNS. As a social media with high richness, SNS supports transmission of rich social cues, which is very helpful to make users perform communication in a style that is similar to face-to-face communication, and then resulting in flow experience.

In conclusion, the purpose of this study was to apply the Stimulus-Organism-Response (S-O-R) paradigm to the study of SNS users' loyalty, and the results of this study provide support for the research model and for most of the hypotheses. Generally speaking, interactivity of SNS affects users' experience of presence and flow, and users' experience further influence their loyalty to SNS. This research has some limitations. First, we selected university students as our sample. Although they represent a major group of SNS users, the results need to be interpreted with caution and future research needs to generalize our results to other samples, such as working professionals, older or younger users. Second, we only took into account the interactive features of SNS and users' experiential factors in the model. But SNS users' cognitive factors (e.g. perceived usefulness) and attitudinal factors (e.g. satisfaction) and social factors (e.g. trust, sense of belonging) also affect users' continuance intention to SNS. Future research could extend the conceptual framework of this study by adding other factors and verifying the relationships between these factors.

ACKNOWLEDGMENT

This work was supported by a grant from the National Natural Science Foundation of China (71371062) and the National Basic Research Program of China (973 Program) (2013CB329603).

REFERENCES

- [1] Al-Debei, M.M., Al-Lozi, E., & Papazafeiropoulou, A. (2013) 'Why people keep coming back to Facebook: Explaining and predicting continuance participation from an extended theory of planned behaviour perspective', *Decision Support Systems*, Vol. 55, pp.43-54.
- [2] Anderson, J. C., & Gerbing, D. W. (1988) 'Structural equation modeling in practice: a review and recommended two-step approach', *Psychological Bulletin*, Vol. 103, No. 3, pp. 411-423.
- [3] Animesh, A. P., Yang, S. B., & Oh, W. (2011) 'An odyssey into virtual worlds: exploring the impacts of technological and spatial environments on intention to purchase virtual products', *MIS Quarterly*, Vol.35, No. 3, pp. 780-810.
- [4] Bagozzi, R. P., Yi, Y., & Phillips, L. (1991) 'Assessing construct validity in organizational research', *Administrative Science Quarterly*, Vol. 36, No. 3, pp. 421-458.
- [5] Biocca, F., & Harms, C. (2002) 'Defining and measuring social presence: Contribution to the Networked Minds Theory and Measure', *Proceedings of the 5th International PRESENCE workshop*, Porto, Portugal, pp.1-38.
- [6] Chang, C. (2013) 'Examining users' intention to continue using social network games: A flow experience perspective', *Telematics and Informatics*, Vol. 30, No.4, pp. 311-321.
- [7] Chang, Y., & Zhu, D. (2012) 'The role of perceived social capital and flow experience in building users' continuance intention to social networking sites in China', *Computers in Human Behavior*, Vol. 28, pp. 995-1001.
- [8] Cheng, Y. M. (2013) 'Exploring the roles of interaction and flow in explaining nurses' e-learning acceptance', *Nurse Education Today*, Vol. 33, No. 1, pp. 73-80.
- [9] Cheung, C. M. K., Chiu, P. Y., & Lee, M. K. O. (2011) 'Online social networks: Why do students use facebook? ', *Computers in Human Behavior*, Vol. 27, pp. 1337-1343.
- [10] Choi, D., & Kim, J. (2004) 'Why people continue to play online games: In search of critical design factors to increase customer loyalty to online contents', *Cyberpsychology and Behavior*, Vol. 7, No. 1, pp. 12-24.
- [11] CNNIC. (2014) '33th Statistical Survey Report on the Internet Development in China', Available at: <http://www.cnnic.com.cn/hlwfzyj/hlwzxbg/hlwtjbg/201403/P020140305346585959798.pdf> (accessed 5 March 2014).
- [12] Csikszentmihalyi, M. (1975) *Beyond Boredom and Anxiety*, Jossey-Bass Publishers, San Francisco.
- [13] Cyr, D., Hassanein, K., & Head, M., et al. (2007) 'The role of social presence in establishing loyalty in e-service environments', *Interacting with Computers*, Vol. 19, No. 1, pp. 43-56.
- [14] Faiola, A., Newlon, C., & Pfaff, M., et al. (2013) 'Correlating the effects of flow and telepresence in virtual worlds: Enhancing our understanding of user behavior in game-based learning', *Computers in Human Behavior*, Vol. 29, No. 3, pp.1113-1121.
- [15] Fornell, C., & Larcker, D. F. (1981) 'Structural equation models with unobservable variables and measurement error: algebra and statistics', *Journal of Marketing Research*, Vol. 18, No. 3, pp. 382-388.
- [16] Hassanein, K., & Head, M. (2007) 'Manipulating perceived social presence through the web interface and its impact on attitude towards online shopping', *International Journal of Human-Computer Studies*, Vol. 65, No. 8, pp. 689-708.
- [17] Hausman, A. V., & Siekpe, J. S. (2009) 'The effect of web interface features on consumer online purchase intentions', *Journal of Business Research*, Vol. 62, No. 1, pp. 5-13.

- [18] Heeter, C. (1992) 'Being there: the subjective experience of presence', *Presence*, Vol. 1, No. 2, pp. 262-271.
- [19] Hoffman, D. L., & Novak, T. P. (1996) 'Marketing in hypermedia computer-mediated environments: Conceptual foundations', *Journal of Marketing*, Vol. 60, No. 3, pp. 50-68.
- [20] Huang, E. (2012) 'Online experiences and virtual goods purchase intention', *Internet Research*, Vol. 22, No. 3, pp. 252-274.
- [21] Koufaris, M. (2002) 'Applying the technology acceptance model and flow theory to online consumer behavior', *Information Systems Research*, Vol. 13, No. 2, pp. 205-223.
- [22] Lee, M. C. (2010) 'Explaining and predicting user continuance intention toward e-learning: An extension of the expectation-confirmation model', *Computers & Education*, Vol. 54, No. 2, pp. 506-516.
- [23] Liao, L. F. (2006) 'A Flow Theory Perspective on Learner Motivation and Behavior in Distance Education', *Distance Education*, Vol. 27, No. 1, pp. 45-62.
- [24] Lin, H., Fan, W., & Chau, P. Y. K. (2014) 'Determinants of users' continuance of social networking sites: A self-regulation perspective', *Information & Management*, Vol. 51, No.5, pp. 595-603.
- [25] Lombard, M., & Ditton, T. (1997) 'At the Heart of It All: The Concept of Presence', *Journal of Computer Mediated-Communication*, Vol. 32, No. 2, pp. 1-10.
- [26] Mehrabian, A., & Russell, J. A. (1974) *An Approach to Environmental Psychology*, The MIT Press, Cambridge, Massachusetts.
- [27] Novak, T., Hoffman, D., & Yung, Y. (2000) 'Measuring the customer experience in online environments: A structural modeling approach', *Marketing Science*, Vol. 19, No.1, pp. 22-42.
- [28] Nunnally, J. (1978) *Psychometric Theory*, McGraw-Hill, New York.
- [29] Shang, R. A., Chen, Y. C., & Huang, S. C. (2012) 'A private versus a public space Anonymity and buying decorative symbolic goods for avatars in a virtual world', *Computers in Human Behavior*, Vol. 28, pp. 2227-2235.
- [30] Shen, K. N., & Khalifa, M. (2012) 'System design effects on online impulse buying', *Internet Research*, Vol. 22, No.4, pp. 396-425
- [31] Shi, N., Lee, M. K. O., & Cheung, C. M. K., et al.(2010) 'The continuance of online social networks: How to keep people using Facebook', *Proceedings of the 43rd Hawaii International Conference on System Sciences (HICSS 2010)*, Hawaii, USA, pp. 3049-3058.
- [32] Short, J., Williams, E., & Christie, B. (1976) *The social psychology of telecommunications*, Wiley, London.
- [33] Sicilia, M., Ruiz, S., Munuera, J. L.(2005). 'Effects of interactivity in a web site'. *Journal of Advertising*, 34(3), 31- 46.
- [34] Skadberg, T., & Kimmel, J. (2004) 'Visitors' flow experience while browsing a web site: its measurement, contributing factors and consequences', *Computers in Human Behavior*, Vol. 20, No.3, pp. 403-422.
- [35] Steuer, J. (1992) 'Defining virtual reality: dimensions determining telepresence', *Journal of Communication*, Vol.42, No.4, pp. 73-93.
- [36] Suntornpithug, N., & Khamalah, J. (2010) 'Machine and person interactivity: the driving forces behind influences on consumers' willingness to purchase online', *Journal of Electronic Commerce Research*, Vol.11, No.4, pp. 299-325.
- [37] van Noort, G., Voorveld, H., & van Reijmersdal, E. A. (2012) 'Interactivity in brand web sites: cognitive, affective, and behavioral responses explained by consumers' online flow experience', *Journal of Interactive Marketing*, Vol. 26, pp. 223-234.
- [38] Wang, D., Xu, L., & Chan, H.C. (2008) 'Understanding users' continuance of Facebook: The role of general and specific computer self-efficacy', *Proceedings of the 29th International Conference on Information Systems(ICIS 2008)*, Paris, France, Paper 168.
- [39] Zaman, M., Anadarajan, M., & Dai, Q. (2010) 'Experiencing flow with instant messaging and its facilitating role on creative behaviors', *Computers in Human Behavior*, Vol. 26, No. 5, pp. 1009-1018.
- [40] Zhou, T., Li, H., & Liu, Y. (2010) 'The effect of flow experience on mobile SNS users' loyalty', *Industrial Management & Data Systems*, Vol. 110, No. 6, pp. 930-946.

APPENDIX

Construct	Item	Loading
Machine interactivity	MI1. I felt that I had a lot of control over my browsing this SNS.	.727
	MI2. While I browsed this SNS, I could choose freely what I wanted to see.	.825
	MI3. The SNS processed my input very quickly.	.823
	MI4. Pages on this SNS usually load quickly.	.847
Person interactivity	PI1. This SNS facilitates two-way communication between users	.783
	PI2. I can get in contact with my friends via various communication tools within this SNS.	.766
	PI3. I can receive my friends' fast feedback via various communication tools within this	.798
	PI4. I can share information with my friends via various communication tools on this SNS.	.795
Telepresence	TP1. I forget about my immediate surroundings when I am in the SNS	.845

	TP2. Being in this SNS often makes me forget where I am.	.893
	TP3. After using this SNS, I feel like I come back to the “real world” after a journey.	.871
	TP4. When I am in this SNS, I feel I am in a world created by the web sites I visit.	.933
Social presence	SP1. On this SNS, I feel I talk to my friends as though they were in the same room.	.814
	SP2. On this SNS, I feel a sense of being face-to-face with my friends.	.854
	SP3. On this SNS, I feel that other people seem 'REAL'.	.843
	SP4. This SNS makes me feel I am together with my friends.	.780
Flow experience	FL1. I feel time passes quickly while using this SNS.	.856
	FL2. When using this SNS, my attention is totally focused.	.819
	FL3. While using this SNS, I was entirely absorbed in what I am doing.	.905
	FL4. I felt enjoyable when I was browsing this SNS.	.852
Loyalty	LOY1. I will continue using this SNS.	.862
	LOY2. When using SNS, I consider this SNS to be my first choice.	.856
	LOY3. I will recommend this SNS to others.	.816
