

Summer 6-27-2016

# SOCIAL NETWORKING SITE ADDICTION: THE COGNITIVE BIAS PERSPECTIVE

Dimple R. Thadani

*Hong Kong Baptist University, dimplet@hkbu.edu.hk*

Christy M. K. Cheung

*Hong Kong Baptist University, ccheung@hkbu.edu.hk*

Zach W. Y. Lee

*The University of Nottingham Ningbo China, zach.lee@nottingham.edu.cn*

Follow this and additional works at: <http://aisel.aisnet.org/pacis2016>

---

## Recommended Citation

Thadani, Dimple R.; Cheung, Christy M. K.; and Lee, Zach W. Y., "SOCIAL NETWORKING SITE ADDICTION: THE COGNITIVE BIAS PERSPECTIVE" (2016). *PACIS 2016 Proceedings*. 323.

<http://aisel.aisnet.org/pacis2016/323>

This material is brought to you by the Pacific Asia Conference on Information Systems (PACIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in PACIS 2016 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact [elibrary@aisnet.org](mailto:elibrary@aisnet.org).

# SOCIAL NETWORKING SITE ADDICTION: THE COGNITIVE BIAS PERSPECTIVE

Dimple R. Thadani, Department of Finance and Decision Sciences, Hong Kong Baptist University, Hong Kong, [dimplet@hkbu.edu.hk](mailto:dimplet@hkbu.edu.hk)

Christy M. K. Cheung, Department of Finance and Decision Sciences, Hong Kong Baptist University, Hong Kong, [ccheung@hkbu.edu.hk](mailto:ccheung@hkbu.edu.hk)

Zach W. Y. Lee, Nottingham University Business School China, The University of Nottingham Ningbo China, Zhejiang, China, [Zach.Lee@nottingham.edu.cn](mailto:Zach.Lee@nottingham.edu.cn)

## Abstract

*With growing concerns about the dark side of social networking sites (SNSs), IS scholars pioneering technology addiction have begun to advocate for more MIS research to better conceptualize and examine problems related to technology use. In this study, we adopted the cognitive bias perspective to explain how SNS addiction distorts users' cognition and affects their decision to continue using SNSs. We tested our research model with 238 active Facebook users and the results support our research model and hypotheses. Specifically, we found that Facebook addiction influences the usage decisions by altering user belief systems (i.e., intensifying their cognition about how Facebook use fulfills their needs). We expect that the findings enrich the literature on IS use by confirming the role of addiction in IS usage decision in the context of SNSs. We also believe that the findings provide SNS service providers, educators, and parents with some insights into the impact of SNS addiction.*

*Keywords: Social Networking Sites, Facebook, Addiction, Cognitive Bias, Uses and Gratifications.*

# 1 INTRODUCTION

Using social networking sites (SNSs) becomes a daily activity. Users log on to SNSs and spend significant amounts of time updating their personal profiles, meeting friends, chatting, playing games, and checking updates (e.g., Boyd & Ellison 2007). Though SNSs represent an incredible platform for entertainment, social connection and obtaining information, social networking site (SNS) use can lead to significant behavioral or psychological problems (Kwan and Skoric, 2013). Consistent with tradition in the IS literature, most existing studies emphasize the positive and productive value of SNS use, treating it as a positive phenomenon that will always generate a desirable outcome. Research on the dark side of IS/IT use remains new in the IS literature (Markus & Mentzer 2014; Tarafdar et al. 2015). Turel and his team, pioneers in problematic use of IS/IT, have explored the concept of addiction in various IS contexts, including SNSs (e.g., Turel & Serenko 2012). Their study focused on how perceived enjoyment influences SNS addiction through reduced attention to the future negative consequences of habitual use.

Though we witness increasing scholarly attention toward technology addiction, our review of prior literature on SNS addiction shows that this line of research is still in its development stage, evident by the unsystematic focus and exploratory nature of investigation. For instance, we notice that existing studies on SNS addiction mostly focus on the addiction instrument development (e.g., Andreassen et al. 2012; Zaremohzzahieh et al. 2014), the association between personality and SNS addiction (e.g., Andreassen et al. 2013; Wilson et al. 2010), and the negative impact of SNS addiction (e.g., Abdulahi et al. 2014; Lee 2015). In response to the call for more research in the dark side of IS/IT use (Tarafdar et al. 2013; 2015), this study aims to advance our theoretical understanding of the impact of technology addiction on SNS use through the cognitive bias perspective. We believe that this study will make important theoretical and practical contributions. On the theoretical side, we empirically confirm the role of addiction in IS usage decision in the context of SNSs. On the practical side, we believe that the findings provide SNS service providers, educators, and parents with some insights into the impact of SNS addiction.

## 2 THEORETICAL BACKGROUND

### 2.1 Technology Addiction

The issue of problematic use of information technology is relatively new in the IS literature, and scientific understanding of this issue is still evolving. Technology addiction is a special type of behavioral addiction (Holden 2001) that encapsulates a psychological dependency on the use of an IT. Young (1996) was the first to bring clinical attention to problematic Internet use and raised a cautionary tale of the psychological harm of using the Internet. Since then, empirical research on problematic Internet use has grown substantially. Researchers have further investigated the subtypes of Internet-based problems, such as online game addiction (Charlton & Danforth 2007). With the growing popularity of SNSs, recent evidence suggests that there may be worrisome level of addiction among SNS users (Fenichel 2011; Griffin. 1999; Karaiskos et al. 2010; Pempek et al. 2009; Turel & Serenko 2012) as the platforms can be an addiction-prone technology (Xu et al. 2012). SNS addiction is defined as a form of behavioral addiction which includes excessive interaction with SNSs (i.e., both the technology and the content it provides) under conditions of psychological dependency (Griffiths 1999). Andreassen et al. (2012) investigated the symptoms of addiction in the SNS context and proposed that SNS addiction is manifested through the following six symptoms:

1. ***Salience***: SNS use dominates user's thinking and behavior;
2. ***Mood modification***: engaging in SNSs modifies/improves mood;
3. ***Tolerance***: an increasing amount of SNS use are required to achieve or maintain the desired positive emotion;
4. ***Withdrawal***: cessation of SNS use leads to occurrence of unpleasant emotions or feelings;

5. **Conflict:** engaging in the SNSs leads to conflicts in relationships, in work/education, and other activities;
6. **Relapse:** a tendency to revert to earlier patterns of SNS use after abstinence or control.

## 2.2 The Use of Social Networking Sites (SNSs)

With the growth and public popularity of SNSs, we witnessed a significant number of studies explaining the reasons why individuals adopt and use SNSs. For example, Ellison et al. (2007) examined how Facebook use affects the formation and maintenance of social capital. Cheung and Lee (2010) argued that Facebook use is a collective behavior and used the three major social influence processes (subjective norm, group norm, and social identity) to explain we-intention to use Facebook.

Uses and gratifications (U&G) theory is one of the dominant theories used to examine the motives and uses of SNSs. This paradigm explains the use of a specific medium so as to elucidate the psychological needs that motivate people to use a particular medium. In particular, the discrepancy between needs fulfilment which an individual is seeking and the extent to which the individual believed that the fulfilment sought is obtaining explains the use of a particular medium (Plamgreen & Rayburn 1979, Rubin 2002). A prominent study of motives in the online context is by Dholakia et al. (2004). They built their study upon U&G theory, identifying five motivational factors of virtual communities' use, which are also widely adopted to explain SNS use (e.g., Brandtzæg & Heim 2009; Kim et al. 2011; Krisanic 2008; Raacke & Bonds-Raacke 2008):

1. **Entertainment value** refers to the fun and relaxation of playing or otherwise interacting with other users.
2. **Maintaining interpersonal connectivity** refers to the social benefits derived from establishing and keeping in contacts with other people such as social support and friendship.
3. **Purposive value** refers to the value derived from accomplishing some predetermined informational and instrumental purposes.
4. **Self-discovery** refers to the understanding of one's self through social interactions.
5. **Social enhancement** refers to the value derived from gaining acceptance from other members in the community, and the enhancement of one's social status within the community through one's contributions.

## 2.3 Cognitive Bias Perspective

SNS addiction, like other addictions, can rewire users' brains and make them hypersensitive to stimuli (SNS use), which modifies their perception system (Robinson & Berridge 1993, 2001; Turel et al. 2011). Bias-based cognitive change mechanism is believed to be in play when users are addicted to information and communication technologies (ICTs) such as online auction sites (Turel et al. 2011). In particular, previous positive interactions with the technology motivate these addicts to seek for confirmatory and disregard most of the dis-confirmatory evidence (Turel et al. 2011). The confirmation bias causes these users to ignore negative experiences that contradict their previously established beliefs and frame their use positive even they are ashamed of their behaviors (Ferraro et al. 2007). As a result of these bias-based cognitive change processes, the way addicts perceive internal and external factors is altered, which often results in misrepresented reality (Greenfield & Rogers 1999; Turel et al. 2011). Huh and Bowman (2008) confirmed that addicted users developed inflated system evaluation and perceived computer games more positively than non-addicted. Thus, a similar intensification of positive system-referenced perceptions is likely to exist in SNSs.

# 3 RESEARCH MODEL AND HYPOTHESES

In this study, we attempt to examine how addiction distorts the users' belief system and thus affects their decision to continue to use SNSs. Figure 1 depicts the research model.

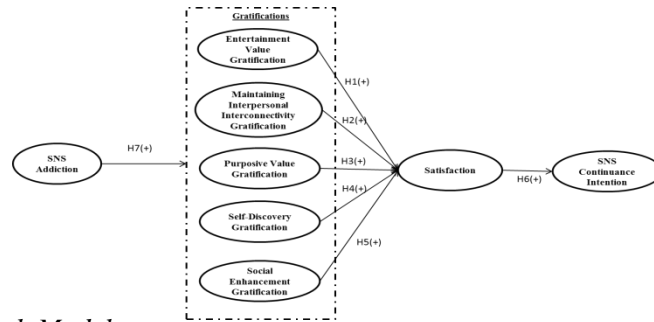


Figure 1. Research Model

### 3.1 Uses and Gratifications of SNSs

U&G theory has been widely used to explain SNS use in prior literature. The U&G approach assumes that users have specific end-state goals before using a particular technology. This type of goal is similar to user expectations. If their motivations are fulfilled (gratified), users feel satisfied. Some recent studies have used the U&G paradigm to investigate gratification from SNS use. In this study, we build on previous research (e.g. Brandtzaæg and Heim, 2009; Kim et al., 2011) and focus on the five most common gratifications in the context of SNSs. The definitions and detailed descriptions of these five major gratifications in SNS use are summarized in Table 1.

Gratifications	Definition
Entertainment value	Fulfillment of users' needs to have fun and relax from playing or otherwise interacting with other users.
Maintaining interpersonal Interconnectivity	Fulfillment of users' needs to establish and maintain contact with other people.
Purposive value	Fulfillment of users' informational needs through accomplishing predetermined informational and instrumental goals.
Self-discovery	Fulfillment of users' needs to understand oneself through from social interactions.
Social enhancement	Fulfillment of users' needs to gain acceptance and enhance one's social status within the community.

Table 1. Gratifications of SNS Use

Recently, we have witnessed a significant number of studies in the IS literature applying the uses and gratifications (U&G) paradigm (Katz 1959; Katz et al. 1973) to explain the relationship between need gratification and user satisfaction. The U&G approach assumes that if motivations of users of a particular technology are fulfilled (gratified), users feel satisfied. Applying the U&G paradigm to the current investigation, we expect that the gratifications from the use of SNSs (entertainment value, maintaining interpersonal connectivity, purposive value, self-discovery, and social enhancement) will lead to satisfaction from SNS use. Satisfaction in turn affects user's decision to continue using SNSs. Thus, we propose the following hypotheses.

- H1: The gratification of entertainment value is positively associated with satisfaction from SNS use.*
- H2: The gratification of maintaining interpersonal interconnectivity is positively associated with satisfaction from SNS use.*
- H3: The gratification of purposive value is positively associated with satisfaction from SNS use.*
- H4: The gratification of self-discovery is positively associated with satisfaction from SNS use.*
- H5: The gratification of social enhancement is positively associated with satisfaction from the SNS use.*
- H6: Satisfaction from SNS use is positively associated with SNS continuance intention.*

### 3.2 SNS Addiction

Prior research empirically showed that addictive behaviors are often accompanied by a number of psychological processes which are responsible for forming cognitive bias which affects and distort user's perceptions of external and internal factors (Perl et al. 1997; Greenfield & Rogers 1999)

including one's belief on the system at hand (Turel et al. 2010; 2011). Often, perception of addicts is distorted to an extent in which they might impair their views of reality so as to justify their own behaviors (Coombs 2004). In that sense, SNS addiction is expected to exhibit a cognitive bias towards the usage experience. Specifically, the cognitive bias exerts a positive "framing effect" on the benefit they could obtain from using SNSs, which takes the form of gratification in our study. SNS addicts are only able to see the positive side of using the system but ignore or minimize the negative views.

The hypotheses presented below build on the aforementioned notions that SNS addiction is a factor that may intensify perceptions through bias-based cognition modification processes. Overall, it is expected that addiction to SNS allows users to perceive the usage experience more positively, in terms of the support obtained by SNSs to fulfill their needs. We therefore presume that users who exhibit higher level of addiction develop more positive perceptions about the system, which is represented by higher level of fulfillment of their needs (i.e., gratifications). Thus, we have the following hypothesis:

*H7: SNS Addiction is positively associated with (a) entertainment value; (b) maintaining interpersonal interconnectivity; (c) purposive value; (d) self-discovery; and (e) social enhancement*

## **4 STUDY DESIGN AND METHOD**

We tested our proposed research model and hypotheses via an online survey with active Facebook users. We considered Facebook appropriate for the study because of its popularity: there were over 1.55 billion active Facebook users as of January 2016.

### **4.1 Data Collection Procedures**

Data for this study was collected from Amazon Mechanical Turk (MTurk) system in January 2016. MTurk is an online crowdsourcing platform where people can choose to participate in tasks for remuneration. It facilitates survey distribution, completion and retrieval. The use of MTurk respondents is appropriate for two reasons (Steelman et al. 2014). First, respondents recruited via MTurk are diversified in terms of age and ethnic (Behrend et al. 2011). Second, response data collected via MTurk has been found to be as reliable as online survey panels (Ayyagari et al. 2011), fulfilling the publication standard in top tier journals (O'Leary et al. 2014).

A screening question was used to ensure that the respondents were current active users of Facebook. A monetary incentive was given upon successful completion of all survey questions. To avoid priming, the surveys were positioned as for examining user online behaviors on SNSs. A total of 238 usable questionnaires were collected. There were no missing values in the questionnaire. Among the respondents, 58.1% were female and 90% of the respondents aged below 46 years old.

### **4.2 Measurement**

Items for Facebook addiction was borrowed from the Bergen Facebook Addiction Scale (Andreassen et al. 2012). Satisfaction (SAT) and SNS continuance intention (CI) were assessed using measures from Bhattacharjee (2001). Finally, the five gratifications were adapted from Dholakia et al. (2004). Respondents assessed all items using a seven-point Likert scale and, where necessary, we modified the items to fit the Facebook context. We provide the measurement items in Appendix A.

## **5 DATA ANALYSIS AND RESULTS**

We chose partial least squares (PLS) (SmartPLS 2.0), a component-based structural equation modeling (SEM) technique (Ringle et al. 2005; Vance et al. 2008) for our data analysis as the research context is relatively new. Following the two-stage analytical approach, we first examined the measurement model and then assessed the structural model.

## 5.1 Measurement Model

### 5.1.1 Convergent and Discriminant Validity

Convergent validity is an approach to evaluate a measure based upon how well the measure conforms with theoretical expectation (De Vaus 2002). We verified the convergent validity by assessing two common indices, the composite reliability of constructs (CR), the average variance extracted (AVE) loadings (Barclay et al. 1995; Hu et al. 2004). In this study, both indices exceed the recommended threshold, with the CR ranging from 0.81 to 0.94, and the AVE score ranging from 0.57 to 0.82, as shown in Table 2. In addition, all the items show significant path loadings to their respective constructs, indicating that the instrument has displayed item internal consistency reliability.

Discriminant validity involves demonstrating a lack or very low correlation among different constructs (Kinnear & Talyor 1996). Discriminant validity was verified with the squared root of the average variance extracted for each construct higher than the correlations between it and all other constructs (Fornell & Larcker 1981). Table 2 shows that each construct shares greater variance with its own block of measures than with the other constructs representing a different block of measure. In addition, as we can find that no pair of measures had correlations exceeding the criterion of 0.9 as suggested by (Hair et al. 1998), which implies that no multicollinearity existed among these constructs.

Construct	CR	AVE	ADD	EVG	MIIG	PVG	SDG	SEG	SAT	CI
<b>ADD</b>	0.94	0.76	<b>0.87</b>							
<b>EVG</b>	0.87	0.63	0.37	<b>0.79</b>						
<b>MIIG</b>	0.81	0.68	0.27	0.67	<b>0.83</b>					
<b>PVG</b>	0.92	0.57	0.61	0.37	0.34	<b>0.75</b>				
<b>SDG</b>	0.89	0.80	0.63	0.52	0.54	0.53	<b>0.89</b>			
<b>SEG</b>	0.94	0.82	0.50	0.63	0.47	0.47	0.53	<b>0.91</b>		
<b>SAT</b>	0.94	0.78	0.31	0.56	0.51	0.45	0.46	0.62	<b>0.88</b>	
<b>CI</b>	0.91	0.74	0.40	0.57	0.45	0.47	0.47	0.60	0.56	<b>0.86</b>

Note: The bold numbers highlighted in grey in the diagonal row are the square roots of the average variance extracted (AVE). Key: ADD: SNS addiction, EVG: entertainment value gratification, MIIG: maintaining interpersonal interconnectivity gratification, PVG: purposive value gratification, SDG: self-discovery gratification, SEG: social enhancement gratification, SAT: satisfaction, CI: SNS continuance intention

Table 2. Composite Reliability, AVEs, and Correlation among Latent Constructs

### 5.1.2 Common Method Variance & Social Desirability Bias

Due to the fact that the data was collected from a single source (i.e. Self-report questionnaire), there is a potential for the occurrence of common method bias (Podsakoff et al. 2003). A Harman's one-factor test (Harman 1967; Podsakoff & Organ 1986) was performed. All variables in the questionnaire were subjected to an exploratory factor analysis (principle components factor analysis with no rotation). Results suggested that no single factor explained more than 50% of the variance, indicating the common method effects are not a likely contaminant of the results observed in this investigation.

The influence of social desirability bias (SDB) was assessed by examining the Spearman correlations between SNS addiction and SDB scores (Reynolds, 1982). A negative correlation indicates a threat of SDB. The Spearman correlations between SNS addiction and SDB was  $\rho_{\text{SNS addiction-SDB}} = -0.11, p > 0.05$ . The correlation was non-significant and smaller than the correlation between SDB and technology addiction score reported by Turel et al. (2011) ( $-0.12, p < 0.05$ ). To conclude, SDB did not constitute a major issue in this study.

## 5.2 Structural Model

Using SmartPLS (Version 2.0 M3), the structural model and hypotheses were assessed by examining path coefficients, their significance levels and associated t-values (Chin 1998). The significance of all paths in the model was assessed via 500 bootstrap runs. The results support six of the hypotheses (see Figure 2). The research model explains 30% of the variance in SNS continuance intention. Satisfaction

has a significant effect on continuance intention to use SNSs ( $\beta = 0.55, t = 9.47$ ), supporting H6. Surprisingly, not all gratifications have significant effects on satisfaction. Among the five gratifications, only entertainment value ( $\beta = 0.16, t = 2.04$ ), maintaining interpersonal interconnectivity ( $\beta = 0.18, t = 2.40$ ), purposive value ( $\beta = 0.15, t = 2.50$ ), and social enhancement affordance ( $\beta = 0.35, t = 4.09$ ) are found significant, providing support to H1, 2, 3, and 5. These gratifications together explain 47% of the variance in satisfaction. SNS addiction is shown to be a significant antecedent of all five gratifications, providing support for H7.

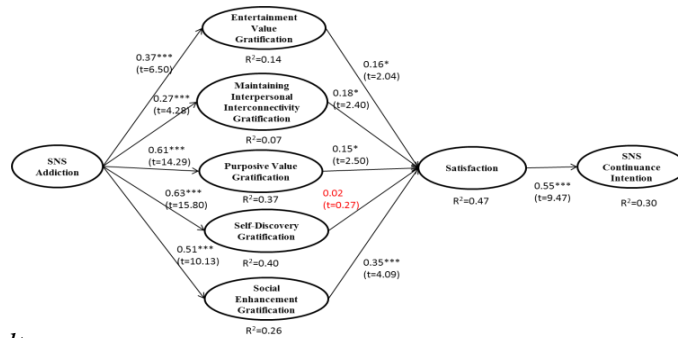


Figure 2. Results

## 6 DISCUSSIONS

### 6.1 Discussion of Results

Recognizing a shortage of theoretical and empirical investigation into problematic technology use in the IS literature, this study was designed to advance our theoretical understanding of SNS addiction. Empirical testing of our research model on 238 active Facebook users found most path coefficients to be statistically significant, lending strong support to both the proposed research model and our hypotheses. We found that SNS addiction was positively associated with all five types of gratifications. In essence, addiction to SNS formed a positive lens through which the system seemed somewhat much better in fulfilling one's motivational needs (Turel et al. 2011). Furthermore, we found the relative impact of the gratifications on user satisfaction, and only self-discovery was not significantly related to user satisfaction. This finding is consistent with previous studies that found relationship maintenance and entertainment to be the most important motivators for SNS use (Chan et al. 2015). However, the relatively strong association between social enhancement gratification and user satisfaction was unexpected. A possible explanation is that more and more SNS users rely on their profiles and social interactions with other users (e.g., likes, shares, and comment on their posts) to promote self-esteem (Gonzales & Hancock 2011). Thus, the fulfilment of social enhancement need has become an important source of hedonic experience with SNS use.

### 6.2 Implications

Research on the dark side of IT/IS use has received far less scholarly attention. The study of SNS addiction is still in its developmental stage. This study attempts to enrich existing literature on IS use by explaining how SNS addiction distorts user's belief system and in turn affects their decision to use SNSs. First, by applying the uses and gratifications paradigm, we identified five major gratifications of SNS use (entertainment value, maintaining interpersonal connectivity, purposive value, self-discovery and social enhancement) and their association with user satisfaction. Furthermore, we found the relative impact of the gratifications on user satisfaction. Specifically, only maintaining interpersonal interconnectivity, social enhancement, and purposive value were significantly related to user satisfaction. Second, the results provide strong statistical evidence of the relationship between SNS addiction and the user's belief system. In other words, SNS addiction is found important in distorting users' perception of the gratifications of SNS use, providing support to the cognitive bias perspective in explaining the impact of technology addiction.



The results of this study have important implications for practitioners. The key implications of this study stem from the finding that addiction augments system-referenced perceptions. In particular, SNS addiction distorts and biases user cognition. Adjusting such maladaptive perceptions may be done with cognitive behavioral therapy (CBT) (Fairburn et al. 1993; Young 2007), which has been proven effective in treating addictive behavior, including alcoholism, drug addiction, and shopping addiction. The approach might require tampering with the IT artefact to modify one’s perceptions to reduce harm. Future study should explore the development and effectiveness of different prevention approaches.

### 6.3 Limitations and Future Research Directions

This study has potential limitations that warrant future research. First, it used cross-sectional data to examine the role of SNS addiction. SNS addiction and its outcomes were simultaneously assessed which makes it difficult to draw conclusion on the temporal relationship between them. Thus future studies should employ a longitudinal design. Second, we investigated the addiction of one of the most popular hedonic technologies, namely SNSs, and the results should thus be generalized to SNS users only. Future studies should replicate and validate the current framework with other hedonic technologies to improve the generalizability of the results. Finally, advances in mobile technology and data services have enabled the ubiquitous use of SNSs, leading to a greater risk of excessive use and the resulting negative outcomes. Future studies should also explore the influence of contextual factors (e.g., mobility) on the problematic use of technology.

## Appendix A

Construct	Items	Construct	Items
SNS Addiction	I spent a lot of time thinking about Facebook or planned use of Facebook. I felt an urge to use Facebook more and more. I used Facebook in order to forget about personal problems. I tried to cut down on the use of Facebook but without success. I became restless or troubled if I have been prohibited from using Facebook. I used Facebook so much that it has had a negative impact on my job/studies.	Self-Discovery Gratification (SDG)	Facebook enables me to learn about myself and others. Facebook enables me to gain insight into myself.
Entertainment Value Gratification (EVG)	Facebook enables me to be entertained. Facebook enables me to play. Facebook enables me to relax. Facebook enables me to pass time away when bored.	Social Enhancement Gratification (SEG)	Facebook enables me to impress others Facebook enables me to feel important
Maintaining Interpersonal Interconnectivity Gratification (MIIG)	Facebook enables me to have something to do with others. Facebook enables me to stay in touch.	Satisfaction (SAT)	How do you feel the overall usage experience with Facebook? Dissatisfied --- Satisfied Displeased --- Pleased Frustrated – Contented Terrible – Delighted
Purposive Value Gratification (PVG)	Facebook enables me to get information. Facebook enables me to learn how to do things. Facebook enables me to provide others with information. Facebook enables me to contribute to a pool of information. Facebook enables me to generate ideas. Facebook enables me to negotiate or bargain. Facebook enables me to get someone to do something for me. Facebook enables me to solve problems. Facebook enables me to make decisions.	SNS Continuance Intention (CI)	Assuming I have access to Facebook, I intend to use it in future. Given that I have access to Facebook, I predict that I would use it in future. If I have access to Facebook, I predict that I would use it frequently in future.

Table A1. Measures

## Acknowledgement

The authors acknowledge with gratitude the generous support of the Hong Kong Baptist University for the project (FRG2/14-15/018) without which the timely production of the current report/publication would not have been feasible.

## References

- Abdulahi, A. Samadi, B. and Gharleghi, B. (2014). A Study on the Negative Effects of Social Networking Sites Such as Facebook among Asia Pacific University Scholars in Malaysia. *International Journal of Business and Social Science*, 5 (10).
- Andreassen, C. S. Griffiths, M. D. Gjertsen, S. R. Krossbakken, E. Kvam, S. and Pallesen, S. (2013). The Relationships between Behavioral Addictions and the Five-factor Model of Personality. *Journal of Behavioral Addictions*, 2 (2), 90-99.
- Andreassen, C. S. Torsheim, T. Brunborg, G. S. and Pallesen, S. (2012). Development of a Facebook Addiction Scale. *Psychological Reports*, 110 (2), 501-517.
- Ayyagari, R. Grover, V. and Purvis, R. (2011). Technostress: Technological Antecedents and Implications. *MIS Quarterly*, 35 (4), 831-858.
- Barclay, D. Thompson, R. and Higgins, C. (1995). The Partial Least Squares (PLS) Approach to Causal Modelling: Personal Computer Adoption and Use an Illustration. *Technology Studies*, 2 (2), 285-309.
- Behrend, T. Sharek, D. Meade, A. and Wiebe, E. (2011). The Viability of Crowdsourcing for Survey Research. *Behavior Research Methods*, 43 (3), 1-14.
- Bhattacharjee, A. (2001). Understanding Information Systems Continuance: An Expectation-Confirmation Model. *MIS Quarterly*, 25 (3), 351-370.
- Boyd, M. D. and Ellison, N. B. (2007). Social Network Sites: Definition, History and Scholarship. *Journal of Computer-Mediated Communication*, 13(1), 210-230.
- Brandtzæg, P. B. and Heim, J. (2009). Why People Use Social Networking Sites (pp. 143-152): *Lect. Notes Computer Science*.
- Chan, T. Cheung, C. M. K. Shi, N. and Lee, K. O. (2015). Gender Differences in Satisfaction with Facebook Users. *Industrial Management & Data Systems*, 115 (1), 182 -206.
- Charlton, J. P. and Danforth, I. D. W. (2007). Distinguishing Addiction and High Engagement in the Context of Online Game Playing. *Computers in Human Behavior*, 23 (3), 1531-1548.
- Cheung, C. M. K. and Lee, M. K. O. (2010). A Theoretical Model of Intentional Social Action in Online Social Networks. *Decision Support Systems*, 49 (1), 24-30.
- Chin, W. W. (1998). The Partial Least Squares Approach for Structural Equation Modeling. In G. A. Marcoulides (Ed.), *Modern Methods for Business Research* (pp. 295-336). Hillsdale: Lawrence Erlbaum Associates.
- Coombs, R. H. (Ed.). (2004). *Addiction Counseling Review: Preparing for Comprehensive, Certification, and Licensing Examinations*. New York: Taylor & Francis.
- De Vaus, D. (2002). *Surveys in Social Research*. London: Routledge.
- Dholakia, U. M. Bagozzi, R. P. and Pearo, L. K. (2004). A Social Influence Model of Consumer Participation in Network and Small-group-based Virtual Communities. *International Journal of Research in Marketing*, 2, 241-263.
- Ellison, N. B. Steinfield, C. and Lampe, C. (2007). The Benefits of Facebook "Friends:" Social Capital and College Students' Use of online social network sites. *Journal of Computer-Mediated Communication*, 12 (4), 1143-1168.
- Fairburn, C. G. Jones, R. Peveler, R. C. Hope, R. A. and O'Connor, M. (1993). Psychotherapy and Bulimia-Nervosa: Longer Term Effects of Interpersonal Psychotherapy Behavior-Therapy, and Cognitive-Behavior Therapy. *Archives of General Psychiatry*, 50 (6), 419-428.
- Fenichel, M. (2009). Facebook Addiction Disorder Retrieved from:  
<http://www.fenichel.com/facebook/>

- Ferraro, G. Caci, B., D Amico, A. and Di Blasi, M. (2007). Internet Addiction Disorder: An Italian Study. *Cyberpsychology & Behavior*, 10 (2), 170-175.
- Fornell, C. and Larcker, D. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, 18 (1), 39-50.
- Gonzales, A. L. and Hancock, J. T. (2011). Mirror, Mirror on my Facebook Wall: Effects of Exposure to Facebook on Self-Esteem. *Cyberpsychology, Behavior, and Social Networking*, 14 (1-2), 79-83.
- Greenfield, T. K. and Rogers, J. D. (1999). Alcoholic Beverage Choice, Risk Perception and Self-Reported Drunk Driving: Effects of Measurement on Risk Analysis. *Addiction*, 94 (11), 1735-1743.
- Griffin, E. J. (1999). Internet addiction: fact or fiction? *The Psychologist: Bulletin of the British Psychological Society*, 12, 246-250.
- Hair, J. F. Anderson, R., E. Tatham, R., L. and Black, W. C. (Eds.). (1998). *Multivariate Data Analysis with Readings*. Englewood Cliffs, NJ: Prentice Hall.
- Harman, H. H. (1967). *Modern factor analysis*. Chicago: University of Chicago Press.
- Holden, C. (2001). "Compulsive Behaviors: 'Behavioral' Addiction: Do They Exist? *Science*, 294(5444), 980-982.
- Hu, X. R. Lin, Z. X. Whinston, A. B. and Zhang, H. (2004). Hope or Hype: On the Viability of Escrow Services Astrusted Third Parties in Online Auction Environments. *Information Systems Research*, 15 (3), 236-249.
- Huh, S. and Bowman, N. D. (2008). Perception and Addiction of Online Games as a Function of Personality Traits. *Journal of Media Psychology*, 13 (2).
- Karaiskos, D. Tzavellas, E. Balta, G. and Paparrigopoulos, T. (2010). Social Network Addiction: a New Clinical Disorder? *European Psychiatry*, 25, 855
- Katz, E. (1959). Mass Communication Research and the Study of Culture. *Studies in Public Communication*, 2 (1-6).
- Katz, E. Blumler, J. G. and Gurevitch, M. (1973). Uses and Gratifications Research. *The Public Opinion Quarterly*, 37 (509-523).
- Kim, Y. Sohn, D. and Choi, S. M. (2011). Cultural Difference in Motivations for using Social Network Sites: A comparative study of American and Korean College Students. *Computers in Human Behavior*, 27 (1), 365-372.
- Kinney, T. C. and Taylor, J. R. (Eds.). (1996). *Marketing Research: An Applied Approach* (5th ed.). New York, NY: McGraw-Hill.
- Krisanic, K. (2008). *Motivations and Impression Management: Predictors of Social Networking Site Use and User Behavior*. Columbia, MO: University of Missouri Press.
- Kwan, G.C.E. and Skoric, M.M. (2013). Facebook Bullying: An Extension of Battles in School. *Computers in Human Behavior*, 29(1), 16-25.
- Lee, S. (2015). Analyzing Negative SNS Behaviors of Elementary and Middle School Students in Korea. *Computers in Human Behavior*, 43, 15-27.
- Markus, M. and Mentzer, K. (2014). Foresight for a Responsible Future with ICT. *Information Systems Frontiers*, 16 (3), 353-368.
- O'Leary, M. B. Wilson, J. M. and Metiu, A. (2014). Beyond Being There: The Symbolic Role of Communication and Identification in Perceptions of Proximity to Geographically Dispersed Colleagues. *MIS Quarterly*, 38 (4), 1219-1243.
- Pempek, T. A. Yermolayeva, Y. A. and Calvert, S. L. (2009). College Students' Social Networking Experiences on Facebook. *Journal of Applied Development Psychology*, 30 (3), 227-238.
- Perl, E. Shufman, E. Vas, A. Luger, S. and Steiner, J. E. (1997). Taste- and Odor-Reactivity in Heroin Addicts. *Israel Journal of Psychiatry and Related Sciences*, 34 (4), 290-299.
- Podsakoff, P. M. MacKenzie, S. B. Lee, J.-Y. and Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88 (879-903).
- Podsakoff, P. M. and Organ, D. W. (1986). Self-reports in organizational research - problems and prospects. *Journal of Management*, 12, 531-544.

- Raacke, J. and Bonds-Raacke, J. (2008). MySpace and Facebook: Applying the Uses and Gratifications Theory to Exploring Friend-networking Sites. *Cyberpsychology & Behavior*, 11 (169-174).
- Ridgway, N. M. Kukar-Kinney, M. and Monroe, K. B. (2008). An expanded conceptualization and a new measure of compulsive buying. *Journal of Consumer Research*, 35 (4), 622-639.
- Ringle, C. M. Wende, S. and Will, A. (2005). *SmartPLS 2.0*. Hamburg.
- Robin, A. M. (2002). The use and gratifications perspective of media effects. In J. Bryant and D. Zillmann (Eds.), *Media Effects: Advances in Theory and Research* (pp. 525-548). Mahwah, NJ: Erlbaum.
- Robinson, T. E. and Berridge, K. C. (1993). The Neural Basis of Drug Craving: An Incentive - Sensitization Theory of Addiction. *Brain Research Reviews*, 18 (3), 247-291.
- Robinson, T. E. and Berridge, K. C. (2001). Incentive - Sensitization and Addiction. *Addiction*, 96 (1), 103-114.
- Steelman, Z. R. Hammer, B. I. and Limayem, M. (2014). Data Collection in the Digital Age: Innovative Alternatives to Student Samples. *MIS Quarterly*, 38 (2), 355-378.
- Tarafdar, M. Gupta, A. and Turel, O. (2013). The dark side of information technology use. *Information Systems Journal*, 23, 269-275.
- Tarafdar, M. Gupta, A. and Turel, O. (2015). Special Issue on 'Dark Side of Information Technology Use': an Introduction and a Framework for Research. *Information Systems Journal*, 25 (3), 161-170.
- Turel, O. and Serenko, A. (2010). Is Mobile email Addiction Overlooked? *Communications of the ACM*, 53 (5), 41-43.
- Turel, O. and Serenko, A. (2012). The Benefits and Dangers of Enjoyment with Social Networking Websites. *European Journal of Information Systems*, 21 (5), 512-528. doi: 10.1057/ejis.2012.1
- Turel, O. Serenko, A. and Giles, P. (2011). Integrating Technology Addiction and Use: An Empirical Investigation of Online Auction Users. *MIS Quarterly*, 35 (4), 1043-1061.
- Vance, A. Elie-Dit-Cosaque, C. and Straub, D. W. (2008). Examining Trust in Information Technology Artifacts: The Effects of System Quality and Culture. *Journal of Management Information Systems*, 24 (4), 73-100.
- Wilson, K. Fornasier, S. and White, K. M. (2010). Psychological predictors of young adults' use of social networking sites. *Cyberpsychology, Behavior, and Social Networking*, 13 (2), 173-177.
- Xu, Z. C. Turel, O. and Yuan, Y. F. (2012). Online Game Addiction among Adolescents: Motivation and Prevention Factors. *European Journal of Information Systems*, 21, 231-240.
- Young, K. S. (1996). Psychology of Computer Use: XL. Addictive Use of the Internet: A Case that Breaks the Stereotype. *Psychological Report* 79, 899-902.
- Young, K. S. (2007). Cognitive Behavior Therapy with Internet Addicts: Treatment Outcomes and Implications. *Cyberpsychology & Behavior*, 10 (5), 671-679.
- Zaremohzzabieh, Z. Samah, B. A. Omar, S. Z. Bolong, J. and Kamarudin, N. A. (2014). Addictive Facebook Use among University Students. *Asian Social Science*, 10 (6), 107-116.