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Christy M.K Cheung

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HOW LONELINESS AFFECTS PROBLEMATIC FACEBOOK USE

Zach W.Y. Lee, Hong Kong Baptist University, 11466685@hkbu.edu.hk

Christy M.K. Cheung, Hong Kong Baptist University, ccheung@hkbu.edu.hk

ABSTRACT

The main objective of this paper is to show how loneliness affects problematic Facebook use. We integrated the concept of loneliness in the advanced cognitive-behavioral model of generalized problematic Internet use and empirically tested the model with 200 Facebook users. Our findings suggested that loneliness predisposes individuals to the development of problematic Facebook use and confirmed that the preference for online social interaction and mood regulation predict deficient self-regulation of Facebook use and which in turn leads to negative outcomes.

Keywords: Problematic Facebook use, Deficient self-regulation, Preference for online social interaction, Loneliness, Psychosocial well-being

INTRODUCTION

As of 2011, there are more than 500,000,000 active Facebook users which equivalent to 1/13 of the entire population on earth. Half of them log in every day. 57% of users talk to people more online than they do in real life. Within just 20 minutes, there are 10,208,000 comments made, 2,716,000 photos uploaded, 2,716,000 messages sent, status updated and lots to mention.[17]

The proliferation of social networking site (SNS), Facebook, dramatically changes the way people communicate and their Internet using patterns. According to a survey entitled “Summer 10 Teen Lifestyle Report” conducted in September 2010 [49] with a total of 1,208 respondents of college-age, SNS was rated the top web destination among both male and female respondents for the first time, and they spent more than 10 hours a week using Facebook. As stated in the report, “Teens have caught the Facebook bug: In a word it would be dominance”.

Before the emergence of Facebook, past studies mostly focused on the problematic Internet use (PIU), its interaction with psychosocial well-beings and the related negative outcomes [3][5][15][20][21][22][23]. Research examining the relationship between PIU and psychosocial well-being can be categorized into three streams, one suggesting that utilization of Internet in communication has an overall positive effect on

psychosocial well-being [28][33][42], while the second one arguing that excessive Internet use will exert negative effects on one’s psychosocial well-being [35][55], and the third one contending that psychosocial problem is the cause rather than effect of addictive or problematic Internet use [9][31]. However, the lack of theoretical grounding [3][15][52][54], makes the available studies on relationships between Internet usages and psychosocial well-being ambiguous. Even in some highly publicized studies, researchers failed to replicate their earlier findings [12][25][29].

With the growing popularity of Facebook, we believe that issues over “problematic Facebook use” instead of “problematic Internet use” should deserve attention from psychologists and scholars in the new era. In addition, the interactive and social features embedded in Facebook [26][50] make it more addictive than other Internet-based technologies. Our review of prior studies on Facebook revealed that most existing Facebook-related studies tend to focus on its positive use [4][47], there are only very few studies examining the dark side of Facebook use, as well as how the use of Facebook related to psychosocial well-being. Thus, we believe that the current study will enrich the research of the negative use of social technologies and serve as an important foundation for future research.

As abundant research have shown that there are significant relationship between PIU and loneliness [34][36][39][40][46][48]. In the current study, we are particularly interested in how loneliness, a psychosocial well-being factor, affects problematic Facebook use. Concerning the role of loneliness, a psychosocial problem, as the distant cause of the problematic Facebook use is attainable owing to the robust theoretical groundings.

To bridge the gap of the prior literature on Facebook use, this study aims (1) to empirically test the advanced Generalized Problematic Internet Use model [10] in the context of Facebook, as well as (2) to examine the role of loneliness as the distant cause of the problematic Facebook use.

LITERATURE REVIEW

The current study draws on research from the literature on problematic use of information technology, interpersonal computer-mediated communication (CMC), social networking sites (i.e., Facebook) and the psychosocial well-being in both CMC and non-computer-mediated context. The theories presented in the current study demonstrate a high degree of relevance between the studies of problematic information technology use in social communication and psychosocial health. It accentuates the role of online social communication played in the relationships among PIU, its negative outcomes, and psychosocial health.

Prior Studies on Facebook

Facebook has gained huge popularity in the last few years. We have witnessed a significant number of studies of Facebook use in recent years. For example, Shi et al. [43] integrated expectation confirmation theory and identified factors that drive the continuance of Facebook usage. Nyland et al. [38] examined the five motives related to the use of SNSs, including meeting new friend, entertainment, relationships maintenance, social events, and media creation. Cheung and Lee [14] argued that Facebook usage 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. Our review of existing publications on Facebook revealed that researchers mostly focus on the positive use of Facebook; there is a lack of theoretical understanding of problematic Facebook use and its interaction with psychosocial well-being.

Problematic Internet Use

Over the years, researchers have explored problematic Internet use. Chen and colleagues [13] examined the possibility of the non-detrimental effects of Internet dependency and proposed an instrument to measure both positive and negative Internet dependency. Song et al. [45] identified new gratification factors specific to problematic Internet use. Young and Rodgers [57] investigated the effect of personality on the development of problematic Internet use.

Studies of problematic Internet use have initiated the line of problematic or dependent use of information technology which in turn built a strong foundation for future research.

Psychosocial Well-Being

Extant research examining the relationships between social communication and psychosocial

well-being, such as loneliness, offers robust support for the claim that individuals with psychosocial problems are less competent in interpersonal interaction. Psychosocially-ill individual are more likely to develop a preference for online social interaction, and which set a stage to the development of PIU. For example, a considerable number of scholars [39][40][46][48] suggested that loneliness exerts a significant effect on individuals' self-and-observer ratings of social competence and thus leads to the development of a preference for online social interaction. Shotton [44] and Davis [15] contended that the Internet itself does not make people isolated; rather, it is loneliness or other related psychosocial problems drives people to incline into online social communication in the first place.

As proposed in the psychosocial distress model of Davis [15], loneliness is treated as one of the distal antecedents to problematic Internet use. Morahan-Martin [36] also argued that lonely individuals perceive online communication as a way to mitigate the social anxiety encountered in traditional face-to-face communication, which makes them show greater preference for online social interaction.

RESEARCH MODEL AND HYPOTHESES

In the current study, we borrowed and combined the cognitive-behavioral theory and psychosocial distress model from Davis [15] and the generalized problematic Internet use (GPIU) model from Caplan [10] in divulging the development of problematic Facebook use, and its interaction with loneliness.

The theory and research model advanced in the current study proposed the following: (a) loneliness predisposes individuals to the development of negative perception of their social competence; (b) these lonely individuals will then develop a preference for online social interaction as an alternative to traditional face-to-face communication as they perceive online social interaction to be easier, more comfortable and less threatening; (c) a preference for online social interaction and using online social interaction for mood regulation will lead to deficient self-regulation (i.e., compulsive use and cognitive preoccupation), which in turn, causes negative outcomes of Facebook use.

Key constructs in the research model

The model of generalized problematic Internet use (GPIU) is extended and the psychosocial health factor is included in the current investigation.

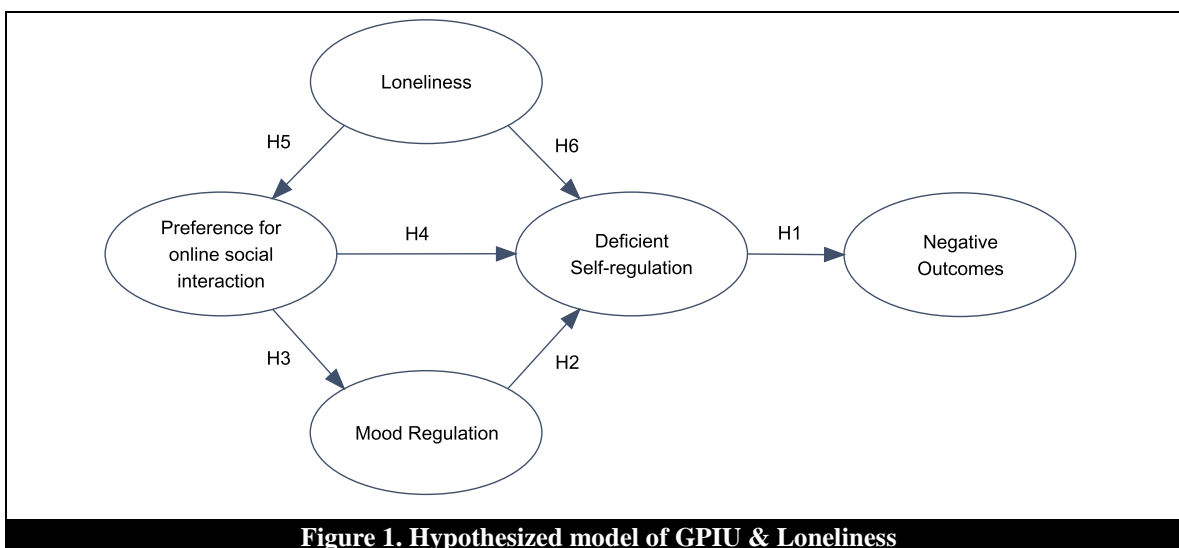


Figure 1. Hypothesized model of GPIU & Loneliness

We borrowed the definition of problematic Internet use from Beard and Wolf [3] and defined the problematic Facebook use as the use of Facebook that creates social, school and/or work difficulties in a person's life.

Negative Outcomes

Negative outcomes refer to social and professional problems resulting from one's problematic Facebook use. Problematic Facebook use will exacerbate existing psychopathologies, and result in a vicious dysfunctional cycle. Davis [15] suggested that, problematic cognitions and behaviors intensify and accumulate over time, and continue to produce negative outcomes, resulting in a diminished sense of self-worth and increased social withdrawal. Suffered individual will lie about their use, and use Facebook to escape from problems in real life.

Deficient self-regulation

Deficient self-regulation is defined as a failure and state of inadequacy in monitoring one's use, judging one's use behaviors and adjusting one's use pattern [1][2]. Deficient self-regulation includes two higher-order constructs, cognitive preoccupation and compulsive use, which help in clarifying GPIU. Cognitive preoccupation is a status of obsessive thinking patterns engaging online activities. Shapira et al. [41] and Caplan and High [11] proposed a similar view on cognitive preoccupation and stated that there was a direct relationship among the cognitive preoccupation, problematic Internet usage and its associated negative outcomes. Deficient self-regulation also takes the form of compulsive use in the behavioral aspect [26][27]. Davis [15] argued that the cognitive and behavioral processes work together to develop negative consequences, and those cognitive and behavioral symptoms are

highly related to online activities featuring social interaction. Applying the model to the context of Facebook, users who become compulsive and obsessive in Facebook activities are most likely to result in negative outcomes, like missing classes, having troubles at work and deteriorating relationships with family and friends.

H1: Deficient self-regulation has a positive relationship with negative outcomes arising from one's Facebook use.

Mood regulation

Mood Regulation is defined as a process of mitigating one's anxiety encountered in interpersonal communications. Regulating mood by Internet use is one of the cognitive symptoms of GPIU as suggested by prior studies [6][9][31]. Caplan [6][9] argued that mood regulation served as an important cognitive predictor for negative consequences of Internet use, as he found out that people who were socially anxious showed greater preference for using the Internet to alleviate anxiety from face-to-face interactions. LaRose et al. [31] also emphasized that mood regulation takes a leading role in developing deficient self-regulation. In addition, Lee and Perry [32] claimed that using the Internet for mood regulation is one of the leading factors to deficient self-regulation.

H2: Using Facebook for mood regulation has a positive relationship with deficient self-regulation of Facebook use.

Preference for online social interaction (POSI)

Prior studies [7][8][9] showed that POSI is a cognitive individual-difference construct. The construct is characterized by the beliefs that one will feel safer, more efficient, more confident, and more relaxing when an individual is pursuing

online social interaction rather than face-to-face interaction. Building on the cognitive-behavioral theory [15], a considerable amount of researchers [7][8][26][27] have identified POSI as one of the important cognitive symptoms of GPIU. Researchers [8][26] has found that POSI also predicts the degree of compulsive use, one of the indicators of deficient self-regulation.

H3: Preference for online social interaction has a positive relationship with mood regulation.

H4: Preference for online social interaction has a positive relationship with deficient self-regulation of Facebook use.

Loneliness

There are extant research examining relationships between online social communication and psychosocial well-being. They offered robust support for the claim that individuals with psychosocial problems perceive themselves as incompetent in social communication. Self-perception of social incompetence leads lonely individuals to seek out what they perceive to be a safer and less threatening form of interaction as an alternative [39][40][46][48]. For instance, Prisbell [39] found that lonely individuals are incompetent in initiating face-to-face social activities and prefer online social interaction. McKenna and colleagues [34] contended that individuals suffering from loneliness prefer socializing online and can better express their real selves online.

In addition, the psychosocial distress model from Davis [15] stated that loneliness is one of the distal antecedents to problematic Internet use. Morahan-Martin [36] also contended that lonely individuals perceive online communication as a way to mitigate the social anxiety encountered in face-to-face communication, which make them show a greater preference for online social interaction.

H5: Loneliness has a positive relationship with preference for online social interaction

Caplan [7] acknowledged the association between psychosocial problems and deficient self-regulation. Similarly, Davis [15] indicated that loneliness acts as a distal cause of PIU as lonely individuals who are not successful in traditional face-to-face interaction will rely heavily on online social interaction. They treat it as a way to overcome or compensate their incompetence in interpersonal communication. Morahan-Martin [36][37], LaRose [31] and Shotton [44] supported the argument that psychosocial problems, like loneliness, would predispose individuals to the formation of preference for online social

interaction and set the stage for deficient self-regulation.

H6: Loneliness has a positive relationship with deficient self-regulation.

METHODOLOGY

Measures

The measures of the constructs in the current study are listed in Table 1(See Appendix). We adopted the Generalized Problematic Internet Use Scale 2 [10] in the current investigation. The scale has been continuously updated and well-validated. We also employed Russell's UCLA Loneliness scale in measuring loneliness. The 20-item scale is one of the most frequently employed instruments for measuring loneliness. All measures have been modified with the specific focus on Facebook and are measured in a seven-point Likert scale, from -4 = strongly disagree" to -7 = strongly agree".

Data Collection

A convenience sample of Facebook users was created by inviting volunteers through Facebook. Facebook users were chosen to be the subject of the study because they were believed to have developed different levels of knowledge related to Facebook use. Questionnaires were administered in an online surveying system, Qualtrics, and the URL of the online questionnaire was distributed through a Facebook event. The study was voluntary and an incentive of a voucher worth US\$15 was offered as a lucky draw prize to encourage more participation. A total of 200 questionnaires were collected. The sample size has met the recommended size [16][19]. Among the 200 respondents, 48% were male and 52% were female. About 87.5% were aged 16-25 and only 1.5% were aged 36 or above.

DATA ANALYSIS

The data analysis was performed in a holistic manner using Smart Partial Least Squares (SmartPLS), version 3. Following the two-step approach analytical procedures, the measurement model was first examined and then followed by the structural model [24]

Measurement Model

Convergent validity indicates the degree to which items of a scale that are theoretically related are also related in reality. It was examined by the use of composite reliability (CR) and average variance extracted (AVE). The critical values for CR and AVE are 0.70 and 0.50 respectively [18]. As shown in Table 2, all CR and AVE values fulfill the recommended levels, with CR ranging from

0.91 to 0.94 and the AVE ranging from 0.52 to 0.83.

Table 2. Psychometric table of measurements					
Construct	Item	Loading	t-value	Mean	S.D.
Deficient Self-regulation CR= 0.91 AVE = 0.63	DS1	0.80	26.40	3.71	1.73
	DS2	0.83	30.09	3.64	1.77
	DS3	0.62	11.50	3.65	1.63
	DS4	0.85	35.68	3.14	1.77
	DS5	0.77	21.45	3.68	1.83
	DS6	0.87	50.00	2.85	1.66
Mood Regulation CR= 0.91 AVE = 0.78	MR1	0.80	24.64	3.85	1.52
	MR2	0.93	85.63	3.84	1.63
	MR3	0.92	65.06	3.73	1.55
Negative Outcomes CR= 0.91 AVE = 0.78	NO1	0.87	35.91	3.13	1.77
	NO2	0.90	48.43	2.91	1.76
	NO3	0.89	50.26	2.61	1.73
POSI CR= 0.93 AVE = 0.83	POSI1	0.95	101.53	3.47	1.62
	POSI2	0.92	61.99	3.41	1.71
	POSI3	0.87	34.61	3.74	1.65
Loneliness CR= 0.94 AVE = 0.52	LONE1	0.73	15.14	3.07	1.18
	LONE2	0.75	21.81	3.65	2.13
	LONE3	0.76	20.16	3.64	1.91
	LONE5	0.78	22.02	3.43	1.68
	LONE6	0.62	10.36	3.67	1.76
	LONE7	0.71	15.56	4.55	1.94
	LONE8	0.72	20.09	4.38	1.93
	LONE10	0.72	16.10	3.96	1.88
	LONE11	0.79	26.19	3.76	1.85
	LONE12	0.79	28.72	4.35	2.13
	LONE13	0.71	17.40	4.42	2.02
	LONE14	0.79	26.36	4.04	2.10
	LONE15	0.61	9.88	4.15	1.85
	LONE16	0.71	14.91	3.31	1.85
LONE18	0.72	20.24	4.74	2.08	
LONE19	0.68	12.29	3.45	1.80	
LONE20	0.72	16.43	3.27	1.85	

Discriminant validity is the degree to which the measurement is different from other variables. It is indicated by low correlations between the measure of interest and the measure of other constructs [18]. Evidence of discriminant validity can be demonstrated when the squared root of AVE for each construct is higher than the correlations between it and all other constructs. As summarized in Table 3, the square root of AVE for each construct is greater than the correlations between them and all other constructs. The results suggest an adequate discriminant validity of all measurements.

Structural model

Figure 2 shows the overall explanatory power, estimated path coefficients (all significant paths are indicated with asterisks), and associated t-value of the paths of the research model.

Table 3. Correlations of constructs					
	DS	MR	NO	POSI	LONE
Deficient Self-Regulation	0.79 ***				
Mood Regulation	0.51***	0.88 ***			
Negative Outcomes	0.76***	0.48***	0.88 ***		
POSI	0.52***	0.58***	0.56***	0.91 ***	
Loneliness	0.42***	0.29***	0.55***	0.47***	0.72 ***

***p<0.01

Notes: Bolded diagonal elements are the squared root of AVE for each construct. Off-diagonal elements are the correlations between constructs

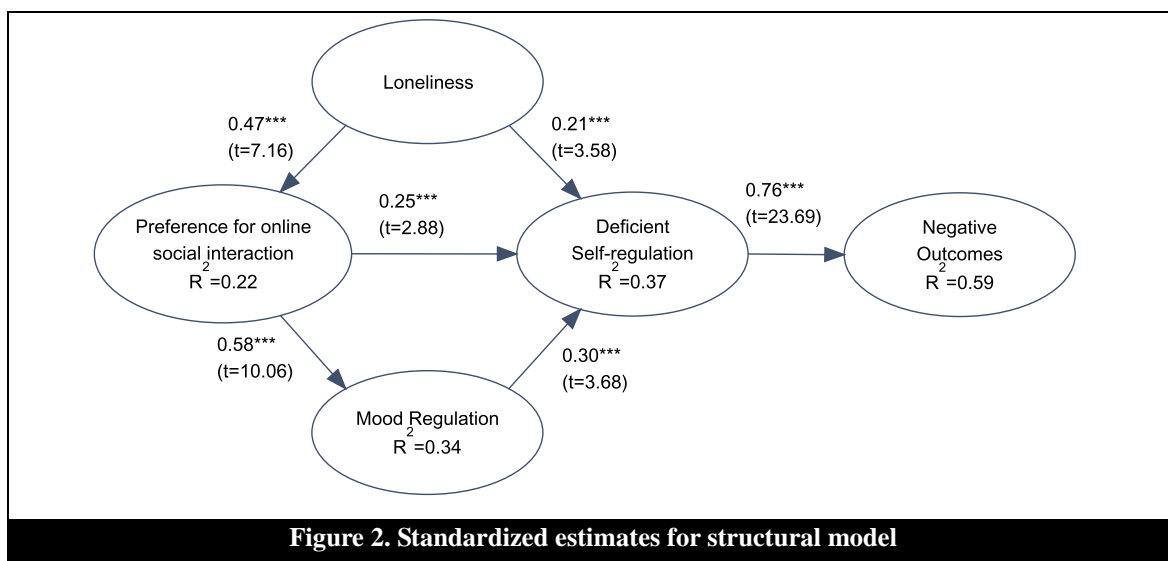
The results illustrate that the exogenous variables explain 59% of variation in Negative outcomes, 37% of variation in Deficient Self-regulation, 34% of variation in Mood regulation and 22% of variation in POSI. All the structural paths are found to be statistically significant in the research model and all hypotheses are supported. Deficient Self-regulation is found to be statistically significant to the Negative Outcomes, with path coefficient at 0.76($t=23.69$). POSI, Mood Regulation and Loneliness are found to have significant effects on Deficient Self-regulation, with path coefficients at 0.25($t=2.88$), 0.30($t=3.68$) and 0.21($t=3.58$) respectively. The POSI is found to have strong impact on Mood Regulation, with path coefficient at 0.58($t=10.06$). And finally Loneliness is found to be statistically significant to POSI, with path coefficient at 0.47($t=7.16$).

DISCUSSION AND CONCLUSIONS

The objectives of the current study are to empirically test the advanced Generalized Problematic Internet Use model [10] in the context of Facebook and to examine how psychosocial well-being factor like loneliness affects the problematic Facebook use. The research model is built on the cognitive-behavioral theory and the psychosocial distress model derived by Davis [15], and the generalized problematic Internet use (GPIU) model from Caplan [10]. The current study gives us further insight into the relationships among problematic Facebook use and its antecedents.

In this study, our measurement model is confirmed with adequate convergent validity and discriminant validity of all measures. The structural model also explains 56% of the variance in negative outcomes. All the hypotheses are statistically supported.

Our results show that loneliness has direct and significant influence to both POSI and deficient



self-regulation. It can be concluded that individuals suffering from loneliness find difficulties in both maintaining face-to-face social interactions and regulating their amount of Facebook use. Lonely individuals tend to rely heavily on online social interaction (Facebook) to compensate for their incompetence in face-to-face interaction and augmentation of troubles in real life. The dependence on online social interaction predisposes them to the development of problematic Facebook use and leads to negative outcomes.

Implication for Research

Research on problematic Facebook use and its relation to psychosocial well-being remains relatively new and receives only little attention from scholars. To enrich the understanding of the phenomenon, we proposed a research model and examined how loneliness affects problematic Facebook use. From the stimulus of the insights from this work, we would like to raise the research communities' awareness with respect to the following issues. First, the current study addresses an important and complicated area in user behaviors in Facebook and helps to validate the instruments for measuring problematic Facebook use. Facebook is widely recognized as one of the most popular platforms for online social interaction. A number of outstanding issues like problematic Facebook use or even Facebook addiction are still under-investigated. This research contributes to the empirical research of problematic Facebook use.

Second, the empirical study depicts the relative importance of antecedent factors for the development of problematic Facebook use and its resulting consequences. It is also one of first

research papers that incorporate the psychosocial well-being factors into the investigation of the problematic Facebook use. The paper helps to unfold the relationship between them and allow the future studies to base on this groundwork.

Implication for Practice

By including behavioral, cognitive and psychosocial well-being variables in the model, it is likely to give practitioners and educators knowledge for evaluating the degree to which users or students are developing problematic Facebook use. It is believed that the results of the study are helpful in providing substantial insights and guidelines for them, as well as any social network platform administrators, so as to create sustainable and healthy social networking environment. When notifying behavioral and/or cognitive symptoms of problematic Facebook use from users or students, they may offer with them some hints or advice as summarized in the following to tackle the misuse.

- A. Organize real-world socializing activities
- B. Give workshop for image and confidence building
- C. Provide counseling service to individuals with emotional need
- D. Set time-limit for each Facebook visiting
- E. Provide pop-up reminders to users about the time spent on the sites over a certain length of time
- F. Offer advice on maintain a balance living style

Limitations and Future Research

The reported results support the hypothesized model, but several limitations in the current methodologies deserve our attention. First, the current study relies heavily on the self-report data in operationalizing the GPIUS2 measures, and does not obtain and include objective measures

like direct observation and non-self-report data, which would in turn greatly enhances the validity and reliability of the measures.

The second limitation of the current study relates to the sample. Though there are participants over 35 years old, the predominant groups of participants are aged 16-25. A sample comprised mostly of students was used for the reason that students are frequent and heavy Facebook users. Any study aiming at investigating the problematic uses, however, should include frequent users of the media rather than simply students.

GPIU have been extensively studied and advanced. Much work, however, is still to be done.

Regarding the advanced GPIU2 model, continuous studies are required to further assess its validity and reliability. For instance, researchers can conduct test-retest for assessing the reliability of the measurements. Data can be collected from diverse or specific groups of respondents to evaluate the model fit of measurements.

Finally, future studies should consider including other types of psychosocial well-being constructs (e.g., Depression, Self-esteem and Shyness) as to produce a more thorough picture and to further improve our understanding of the formation of the problematic use of Facebook and its interaction with other psychosocial well-being factors.

APPENDIX

Table 1. The generalized problematic Internet use scales 2				
Subscales	Item	Item Wording	Source	
Deficient Self-Regulation	DS1	I want to, or have made unsuccessful efforts to, cut down or control my use of Facebook	Caplan (2010)	
	DS2	I have attempted to spend less time on Facebook but have not been able to		
	DS3	I have tried to stop using Facebook for long periods of time.		
	DS4	I am preoccupied with Facebook if I cannot log on for some time		
	DS5	When not on Facebook, I wonder what is happening there		
	DS6	I feel lost of can't go Facebook		
Mood Regulation	MR1	I have used Facebook to talk with others when I was feeling isolated		
	MR2	I use Facebook to make myself feel better when I'm down		
	MR3	I have gone Facebook to make myself feel better when I was down or anxious		
Negative Outcomes	NO1	I have gotten into trouble with my employer or school because of visiting Facebook		
	NO2	I have missed classes or work because of visiting Facebook		
	NO3	I have missed social engagements because of visiting Facebook		
Preference for online social interaction	POS11	I am treated better on Facebook relationships than in my face-to-face relationships		
	POS12	I am more confident socializing on Facebook than I am offline		
	POS13	I am more comfortable with Facebook than people		
Loneliness	LONE1	I feel in tune with the people around me ^a		Russell (1980)
	LONE2	I lack companionship		
	LONE3	There is no one I can turn to		
	LONE4	I do not feel alone ^a		
	LONE5	I feel part of a group of friends ^a		
	LONE6	I have a lot in common with people around me ^a		
	LONE7	I am no longer close to anyone		
	LONE8	My interests and ideas are not shared by those around me		
	LONE9	I am an outgoing person ^a		
	LONE10	There are people I feel close to ^a		
	LONE11	I feel left out		
	LONE12	My social relationships are superficial		
	LONE13	No one really knows me well		
	LONE14	I feel isolated from others		
	LONE15	I can find companionship when I want it ^a		
	LONE16	There are people who really understand me ^a		
	LONE17	I am unhappy being so withdrawn		
LONE18	People are around me but not with me			
LONE19	There are people I can talk to ^a			
LONE20	There are people I can turn to ^a			

^aItem should be reversed (i.e., 1=7, 2=6, 3=5, 4=4, 5=3, 6=2, 7=1) before scoring

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