

Addicted to Facebook: Examining the roles of personality characteristics, gratifications sought and Facebook exposure among youths

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Abstract— This study draws upon the Uses and Gratifications (U&G) theory and past studies on Facebook to deduce factors (i.e: personality characteristics and gratifications sought) that contribute to Facebook addiction amongst university students. Results of factor analysis reveal four dimensions of gratifications (i.e: content, process, social and technology) and introduce self-presentation as the fifth dimension for gratifications sought. Meanwhile, personality characteristics are also factor analyzed and the results show five traits (i.e: shyness, loneliness, powerful others control, internal control and external control) of Facebook users. Using a survey data collected from 400 undergraduate students of one of the public universities in Malaysia, this study tests direct relationships between these factors and Facebook addiction, and the effect of Facebook usage as a mediator to the relationships. The results show insignificant effect of the mediator. This study discovers, on the other hand, significant direct relationships between the factors (except for internal control) and Facebook addiction. Most importantly, the study finds that three dimensions of gratifications sought (i.e: content, self-presentation and social) and two of the personality characteristics (i.e: shyness and loneliness) are significant predictors to Facebook addiction among youths.

Index Terms— Facebook addiction, gratifications sought, personality characteristics, Uses and Gratifications (U&G)

I. INTRODUCTION

One of the most popular activities offered by the Internet is social networking. Social networking sites (SNS) are defined as “web-based services that allow individuals to construct a public/semi-public profile within a bounded system, articulate a list of other users with whom they share a connection and, view and traverse list of connections and those made by others within the system” (Boyd & Ellison, 2007, p. 211). Facebook is the most popular SNS. According to world statistics, Facebook has the highest number of users with 78%, followed by MySpace (14%) and then Twitter (5%) (Fastcompany, 2010).

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The increase of Facebook usage among youths has raised concern about Facebook addiction. This is because addictive behaviour is a behaviour that is excessive, compulsive, uncontrollable and psychologically or physically destructive (Lemmens, Valkenburg & Peter, 2009). A report shows that 48% of youths between the ages of 18 and 34 years old log onto Facebook once they wake up and 28% of them check Facebook on their mobile phone even before getting out of the bed (Socialbakers, 2011). This manifests a kind of Facebook addiction that demonstrates an inability to live or function without it. Facebook addiction has adverse effects on youths such as deterioration in academic performance (e.g: Young, 1998; Kirschner & Karpinski 2010), incompetence to interact in offline social settings (e.g: Chak & Leung, 2004), lack of self-esteem (e.g: Buhrmester & Prager, 1995; Valkenburg, Jochen & Schouten, 2006) and physical problems (e.g: Chou, 2001; Kraut & Seay, 2007).

The notion of addiction can be applied to all types of excessive usage because some core indicators of behavioural addiction has a similarity with those of chemical or substance addiction. Media addiction is one of the addictive behaviour which has no external chemical substance in nature. Some media studies relate addiction to motivation, attitudes, psychological and behavioural aspects. Lin and Tsai (2002) found that those who are dependent on Internet spend more time on Internet and are motivated by sensation seeking reasons. Another study by Chou and Hsiao (2000) found that Internet dependents seek entertainment, interaction and satisfaction in Internet use. Meanwhile, Liu, Cheung and Lee (2010) found that Twitter users tweet for four types of gratifications namely content, social, process and technology gratifications.

Davis (2001), however, proposed psychosocial problems such as loneliness or depression as one of the antecedents to excessive use of the Internet. Individuals who have negative views of themselves use the Internet to get positive responses from others online because they feel less threatened in this sort of environment than real life. These individuals feel that they are treated better and respected more in an online environment compared to an offline one (Junghyun, LaRose & Wei, 2009). Meanwhile, Kim and Haridakis (2009) examine the roles of psychological characteristics (such as shyness, loneliness, locus of control and sensation seeking), motives (such as excitement, control, escape, etc) and also the amount of time spent on the internet in explaining Internet addiction.

As Facebook addiction is prevalent in today's digital age, identifying the factors that contribute to Facebook addiction is deemed necessary. Therefore, this study aims to examine the users' personality characteristics such as shyness, loneliness and locus of control (Kim & Haridakis, 2009) and gratifications sought such as content, social, process and technology gratifications (Liu, Cheung & Lee, 2010) as the contributing factors to Facebook addiction.

Uses and Gratifications (U&G) as a guide

U&G is a media theory in mass communications research that guides the assessment of user motivations of media usage and access (Stafford, Stafford & Schkade, 2004). The main purpose of this paradigm is to explain the reasons why people choose a specific medium over alternative communication media and to elucidate the psychological needs of people who use a particular medium (Liu, Cheung & Lee, 2010). This means that the U&G framework looks at how audiences use a particular medium and the gratifications they derive from the use. The meaning of gratification here is a feeling of satisfaction of a desire (Katz, Blumler, & Gurevitch, 1973). Audiences are motivated to use a media to satisfy their needs from the media.

According to Ruggiero (2000), U&G research has three premises. First, motives which fulfill the needs. Second, social and psychological antecedents that influence the selection of medium content, amount of use, motivation of medium use and possible outcomes of the media experiences. Finally, the consequences or effects which denote the outcome of media use. The outcome can be seen in terms of media dependency. Dependency is a relationship in which the satisfaction of needs or the attainment of goals by one party is contingent upon the resources of another party (Ball-Rokeach & DeFleur, 1976). It is the tendency to depend heavily on a particular communication medium for the fulfillment of needs or wants (Ball-Rokeach & DeFleur, 1976; Greenberg, 1974; Rubin, 1983).

U&G has been applied in many scenarios such as media violence, motives of media use, media addiction and others. U&G has also been used to understand Facebook usage. Sheldon (2008), for instance, found that most of the college students log onto Facebook to maintain relationships with the people they know. Vermaas and Van de Wijngaert (2004), on the other hand, found that basic needs such as information, communication, entertainment and transactions are the motives of Facebook use. Meanwhile, Sharifah Sofiah et al. (2011) identified four motives; i.e: social interaction, passing time, entertainment and companionship, as significant contributors to Facebook addiction among Malaysian female university students.

Gratifications sought

There are studies within U&G framework that categorize motives into typologies of gratifications. Stafford and Stafford (1996) indicate that enjoyment or entertainment, thrill, relaxation and relieving monotony, are the reasons for Internet use and they categorize them as process gratifications. In another study, Stafford, Stafford and Schkade (2004) describe three key dimensions; process, content and social

gratifications for Internet use. Liu, Cheung and Lee (2010) add a new category: technology gratifications for continuous use of Twitter. The current study combines them and thus examines four dimensions of gratifications as the contributing factors to Facebook addiction.

First is content gratification. This dimension of gratification derives from the use of mediated messages for their direct, substantive intrinsic value for the receiver (Cutler & Danowski, 1980). It is of concern about the messages carried by the medium (Cutler & Danowski, 1980). Past studies (e.g: Stafford & Stafford 1998; Dreze & Zufryden, 1997; McDonald,1997) found that users of specific Internet sites are motivated by the informational content. The second dimension is social gratification. It arises from "interactivity" with other parties through media (Liu, Cheung & Lee, 2010). The interactivity is the degree that users can exchange with each other in the media (Williams, Rice & Rogers, 1988). It brings social gratification by satisfying the need of social interaction. Rayburn (1996) indicate that media with a degree of interactivity is more likely to satisfy and retain users. A number of studies (e.g: Armstrong & Hagel, 1996; Eighmey, 1997; Eighmey & McCord, 1998) found social gratifications in Internet use.

The third one is process gratification. It means user receives gratification mainly from being involved in the process of behavior, rather than from message content (Liu, Cheung & Lee 2010). People use media for simple experiences such as browsing websites and playing with the technology. Therefore, process gratification refers to searching for something or passing time. Hoffman and Novak (1996) found users are motivated by the enjoyment felt in the process of using a media. Roy (2009) also found process gratifications of Internet use in India. Last but not least, technology gratification is a new dimension of gratifications sought introduced by Liu, Cheung and Lee (2010) in their study on Twitter usage. Technology gratification refers to the suitable and convenient environment provided by a system (Liu, Cheung & Lee, 2010). Like Twitter, Facebook too has the characteristics of being convenient. Liu, Cheung and Lee (2010) found that technology gratification experienced by twitter users affected the tendency to use the social network site in the future. This study seeks to find direct relationships between all types of gratifications and Facebook addiction.

H1: Content gratification is positively related to Facebook addiction

H2: Social gratification is positively related to Facebook addiction

H3: Process gratification is positively related to Facebook addiction

H4: Technology gratification is positively related to Facebook addiction.

Personality characteristics

Personality characteristics are the biological essences of the users. Many scholars have reported that an individual's personality characteristics do influence media use process (e.g., Park, Hwang, Huh, 2010; Bommelje, Houston & Smither; 2003; Lee Tey et al., 2011). Kim and Haridakis (2009) found that shyness, sensation seeking, and loneliness are positively related and internal control is negatively related

to Internet addiction. In addition, Sheeren N. Zulkefly and Rozumah Baharuddin (2009) found that students with lower self-esteem are more likely to be problematic phone users.

A handful of studies in different contexts supported shyness as being associated with excessive use of new media. Internet addiction studies (Yuen & Lavin, 2004; Chak & Leung, 2004) found that shyness is related to Internet addiction.

According to Yuen and Lavin (2004), the shyness level did not change between face to face communication and online interaction, among college students who are not reliant on the Internet. However, there is a significant difference among the students who are dependent on Internet. Their study shows that a decrease in shyness level in an offline interaction can foster Internet addiction. Ming and Wei (2008) claim that shy people feel less inhibited in a computer mediated communication environment due to the anonymity, lack of physical presence and social cues. Furthermore, Chak and Leung (2004) found that the one with the tendency to be addicted to the Internet is the person with a high shy personality.

Loneliness in another characteristics that could lead to Facebook addiction. According to Weiss (1973), loneliness has two distinct variations: social loneliness caused by a lack of social integratedness and embeddedness, and emotional loneliness caused by the lack of a reliable attachment partner. Past studies have linked loneliness to an increase use of online games (Seay & Kraut, 2007; Valkenburg & Peter, 2009), Internet (Papacharissi & Rubin, 2000; Davis, 2001) and Facebook (Sheldon, 2008). This is because lonely people are socially incompetent and they tend to feel a false sense of security with online activities. This would advocate that loneliness leads to Internet addiction (McKenna & Bargh, 2000; Papacharissi & Rubin, 2000).

In addition to shyness and loneliness, locus of control is also an influential personality trait that could explain Facebook addiction. It reflects the extent of a person's need to be in control (Rotter, 1966). Locus of control has two distinct conditions: internal control (the extent to which he/she is in control of his/her life) and external control (the extent to which he/she believes external forces are in control of his/her life). Prior research has suggested that locus of control can influence media beliefs and perceptions of media portrayals. Wober and Gunter (1982) state that people who believed that their lives were controlled by external forces (e.g., chance, fate and luck) were heavier TV viewers than those who believed that they could control their own lives. Haridakis (2002) also found that externally controlled violent television viewers are more aggressive than the internally controlled viewers. This study aims to test direct relationship between personality characteristics and Facebook addiction.

- H5: Shyness is positively related to Facebook addiction
- H6: Loneliness is positively related to Facebook addiction
- H7a: Powerful others control is positively related to Facebook addiction.
- H7b: Chance control is positively related to Facebook addiction
- H7c: Internal control is negatively related to Facebook

addiction

Facebook exposure

Media exposure denotes the time spent on a specific medium. Many studies (e.g: Widyanto & McMurran, 2004; Leung, 2004; Caplan & High, 2006) show that the higher the amount of time spent online, the greater the symptoms of addiction. These studies agree that media use (amount of usage) is related to unintended consequences of use and addiction.

Widyanto & McMurran (2004) and Leung (2004) suggest that hours spent on the Internet per day was a positive predictor of Internet addiction. Another study by Caplan & High (2006) found that excessive use is associated with problematic Internet use. Similarly, Sheeren N. Zulkefly & Rozumah Baharuddin (2009) found that adolescents who spend more time on mobile phone were more likely to be addicted phone users. Horvath (2004) found that those who measured high on a measure of television addiction tended to be heavy television viewers.

Thus, amount of use is an important variable to consider in addiction studies since most of the prior studies suggest direct relationship between time spent with a medium and addiction to the medium. This study, however, intends to test the extent that personality characteristics and gratifications sought affect Facebook exposure which in turn leads to Facebook addiction. This study posits that Facebook exposure mediates the relationship between the identified factors and Facebook addiction. Thus, the following hypotheses are proposed:

- H8: Facebook exposure mediates the relationships between personality characteristics (i.e: shyness, loneliness and internal control) and Facebook addiction
- H9: Facebook exposure mediates the relationships between gratifications sought (i.e: content, social, process and technology) and Facebook addiction

II. METHOD

A. Sampling

This study explores factors that contribute to Facebook addiction among youths by using a survey technique. A survey is commonly used method to study audiences, media usage and exposure (Gunther, 2000). This study draws upon previous studies (e.g., Ellison, Steinfield & Lampe, 2007) that used university students as study sample – which was selected on the basis that they are active users of Internet applications especially social network sites like Facebook .

The sample for this study was pooled from a large population of students in one of the public universities in Malaysia. One of the advantages of using university students is that they share a common characteristic of internet generation who are generally familiar with online social networking like Facebook.

A total of 400 undergraduate students was sampled using stratified random sampling. The study sample size was calculated using Cohen's (1997) statistical rule ($d=0.20$, $\alpha =$

0.05, $C.I. = 0.80$) that resulted in 393 respondents. Therefore, the number of respondents for this study ($n=400$) was statistically adequate. In the sample selection, students were arranged by hostels. There is a total of eight hostels in the university. Then, fifty respondents of male and female students were selected from each hostel. To achieve better representation, respondents were identified using systematic sampling. The first room number for every hostel was selected at random, and consequently every k th room number in the total number of rooms in the hostel was chosen (systematically) for inclusion in the sample.

B. Material

A questionnaire was used to collect data from the student sample. There are three personality characteristics (i.e: shyness, loneliness and internal control) and four dimensions of gratifications sought (i.e: content, social, process and technology gratifications) were examined in this study. These variables were measured using 5-point Likert scale ranging from strongly disagree (1) to strongly agree (5). Questions for personality characteristics were adopted from Kim & Haridakis (2009) while questions for gratifications sought were taken from Liu, Cheung & Lee (2010).

As for Facebook addiction, there were three dimensions; intrusion, escaping reality and attachment, which was adopted from Kim & Haridakis (2009). The measurement for Facebook addiction also used 5-point Likert scale. Among the statements asked were "I lose track of time when I am using Facebook" and "I feel annoyed if others bother me when I am on FB".

In addition, this study used two open-ended questions from Kim & Haridakis (2009) to measure time spent on Facebook. Answers to the questions were summed in hours and averaged to get the total scores which were used to represent the amount of usage in this study. The two questions were "How much time did you spend on Facebook yesterday? (*the day before participating in the survey*)" and "How much time do you spend on Facebook on a typical day?"

C. Results and discussion

The study found that respondents spent about five hours both on the previous day ($M=4.69$, $S.D.=2.61$) and on a typical day ($M=5.35$, $S.D.=2.75$). To measure Facebook exposure, the hours spent using Facebook on a typical day and the previous day were summed and averaged. This study found that on average respondents spent 5 hours per day on Facebook. LaRose and Eastin (2004) describe youths who spent more than 4 hours per day on Facebook as FB addicts. If exposure is used to measure addiction, respondents of this study can be considered as addicted users of Facebook.

Table 1 (see appendix)

This study, in addition, measures symptoms of Facebook addiction which was adopted from Kim & Haridakis's (2009) study on Internet addiction. The results show high mean scores – which were around 4 out of 5-point Likert scale – for

each dimension of Facebook addiction. Respondents of the study used Facebook as a means of escaping reality ($M=4.16$, $S.D.=.487$) rather than intrusion ($M=4.09$, $S.D.=.417$) and attachment ($M=4.07$, $S.D.=.660$).

In escaping reality, respondents used Facebook to foster intimacy with friends and family ($M=4.40$, $S.D.=.622$) the most compared to other signs of escapism. In term of intrusion, respondents often told themselves "just a few more minutes" when on Facebook ($M=4.36$, $S.D.=.661$). Meanwhile, respondents were highly attached to Facebook that they could not imagine living without it ($M=4.11$, $S.D.=.819$).

Table 2 (see appendix)

A correlation between Facebook exposure and Facebook addiction was also examined. This study found that time spent on Facebook was positively correlated with Facebook addiction ($r=.436$, $p=.000$). The strength of the relationship was moderate. This shows that the higher the amount of time spent on Facebook, the higher the level of Facebook addiction among respondents of the study. The significant result is consistent with Widyanto and McMurrin (2004) who found significant correlation between time spent and addiction.

Results on factor analyses

Two separate factor analyses were performed on the gratifications sought and personality characteristics in order to validate the dimensions of each factor. The results of factor analysis on gratifications sought items (Table 3) show that the four dimensions of gratifications sought adopted from Liu, Cheung and Lee (2010) were retained. The analysis also yielded a new dimension of gratifications sought that indicates the use Facebook to (1) tell others about themselves (2) show their personality and (3) post things they wish to say immediately. This study characterizes the new factor as self-representation (Factor 3).

The percentage of the total variance accounted for by these five factors was 60%. The factor structure obtained for this study was slightly different from the factor structure obtained in Liu, Cheung and Lee. In addition to the introduction of self-representation as a new dimension of gratifications sought, this study removes six items due to the low factor loadings.

Table 3 (see appendix)

The second factor analysis was conducted on 28 items of personality characteristics adopted from Kim and Haridakis (2009). After conducting varimax rotation, eleven items were removed. Most of the deleted items were negatively worded statements in the categories of shyness, internal factors and chance of control. Unlike the factor structure for gratifications sought, there was no new variable from the analysis on personality characteristics. The results (Table 4) show that all five factors were retained. The percentage of the total variance accounted for by these five factors was 45%.

Table 4 (see appendix)

Results on direct vs indirect relationships

This study posits that gratifications sought and personality characteristics predict Facebook addiction. Both were factor analyzed. The results yielded five dimensions of gratifications sought (Table 3) and five characteristics of Facebook users' personality (Table 4). This study then explores the relationships between each factor and Facebook addiction. In testing the relationships, this study treats Facebook exposure as the mediating factor. Thus, this study tests both direct and indirect relationships between variables of the study.

This study uses *zero-order correlation* (also known as Pearson correlation) to examine direct relationships between two variables. Table 5 shows that the relationships between most of the variables and Facebook addiction were significant at zero order correlation. Although the size of the correlations can be considered small ($r = 1 < 3$), they were all significant except for chance control and internal control. The results suggest that the higher the level of gratifications sought (in terms of content, process, self-representation, technology and social gratifications) and personality characteristics (in terms of shyness, loneliness and powerful others control), the higher the level of Facebook addiction. Meanwhile, chance control and internal control have no direct relationship with Facebook addiction.

Nevertheless, correlation results in general do not provide a clear and unambiguous explanation for such relationships (Gravetter & Forzano, 2006; Pallant, 2005). This is because correlation analysis has limitation; the effects of other variables cannot be controlled. An extension of correlation analysis called *partial correlation*, on the other hand, allows one to control for an additional variable. This study employs partial correlation analysis to examine indirect relationships between contributing factors and Facebook addiction, involving control for the effects of Facebook exposure as the mediator.

The testing of indirect effect (or also known as mediation) involves an examination of a relationship in which an independent variable (X) causes a mediating variable (M), which in turn causes the dependent variable (Y). Baron and Kenny argue that "perfect mediation holds if the independent variable has no effect when the mediator is controlled" (1986, p. 1177). The expectations of mediation analysis were to find non-significant results and reductions in correlation coefficients after the effects of mediator were controlled for.

To determine whether the expectations were met, the results of the partial correlation analysis were compared to the results of the zero-order correlation analysis in order to observe any reduction of the correlation coefficients in the relationships after the introduction of controls. Table 6 shows no reduction in the correlation coefficients after controlling for the effects of Facebook exposure. This means that Facebook exposure was not an influential mediator and indirect relationships could not be established in this study.

Table 5 (see appendix)

It is important to note that the role of partial correlation is similar to regression analysis. This study, however, differentiates the two analyses based on the number of variables removed (controlled for) in the analysis. There were more variables controlled for in regression analysis, while only the mediator was removed in partial correlation. An advantage of multiple regression is that it can show prediction. Using multiple regression (Table 6), this study found six contributing factors to Facebook addiction. The results show that content gratifications ($\beta=.168, p=.001$) and loneliness ($\beta=.168, p=.001$) have equal contribution to predict Facebook addiction. This was followed by self-presentation ($\beta=.159, p=.002$), shyness ($\beta=.129, p=.008$), process gratifications ($\beta=.116, p=.021$) and social gratifications ($\beta=.112, p=.024$). Of five gratifications sought examined in this study, technology gratification has no effect on Facebook addiction. Meanwhile, all dimensions of locus of control (i.e: powerful others control, chance control and internal control) were not significant predictors to Facebook addiction. This regression model only explains 20% of variance in Facebook addiction.

Table 6 (see appendix)

In summary, six out of nine hypotheses were accepted in this study. At zero order correlation, all dimensions of gratifications sought were positively correlated with Facebook addiction. As for personality characteristics, shyness and loneliness were positively correlated with Facebook addiction. Out of three dimensions of control, only powerful others control has significant relationship with Facebook addiction while the relationships with chance control and internal control were insignificant. Hypotheses testing on indirect effects also yielded insignificant results.

D. Conclusion

A limitation of this study is that the sample was selected from a pool of undergraduate students from one of the public universities in Malaysia. Although the selection of sample was based on non-probability sampling, it would not be useful to make a parameter estimate because they only represent a segment of youth population in Malaysia. Therefore the results of the study are confined to the sample itself.

The findings indicate significant direct correlations between factors (except for chance control and internal control) and Facebook addiction. Internal control has no relationship with Facebook addiction, both directly and through the mediation of Facebook exposure. The result did not support the hypothesis of the study which predicted a negative relationship between internal control and the Facebook addiction. It is expected that someone with a strong internal control would not be addicted to Facebook. The result of the study did not support this provision. This study also found that none of the indirect relationships examined in this study was significant. This shows that Facebook exposure did not mediate the relationships between the factors and Facebook addiction.

This study found, however, six contributing factors to Facebook addiction among youths at tertiary education.

University students were addicted to Facebook, especially because they can provide, share and present information (content gratifications) with their friends in Facebook. Meanwhile, they were also addicted to Facebook because they were lonely on campus. This could probably be caused by problems of withdrawal from society and thus preference to the online world. Other possibility could be the difficulty to adapt to the people around or the environment of living on campus. In this case, content gratifications and loneliness were the main factors that equally contribute to Facebook addiction.

Self-presentation, a newly emerged gratification sought in this study, was also an important contributor to Facebook addiction. This shows that younger generations were more interested in expressing themselves through which they may attract more friends in Facebook. Most importantly, Facebook has also become a place to express their feelings immediately. They used Facebook to express their emotions as to get feedback quickly and easily – and without cost.

The study also found that the tendency for shy people to be addicted to Facebook was considerably high. This is consistent with previous studies that associate shyness with heavy involvement in online activities. An important factor to be highlighted in this study is that young people often expect entertainment and fun from whatever activities they are involved in. They became addicted to Facebook because they feel that Facebook is entertaining and cost effective to publicize their profile (process gratifications). The students were also addicted to Facebook because they want to meet new people and connect with the person who shares the same value as them (social gratifications). They may find it difficult to do so in face to face interactions.

Interestingly, the study found that respondents spent 5 hours per day on Facebook and this can be considered relatively high. This means that more than one third of day time was spent on Facebook. There is a tendency for university students who spend too much time on Facebook to miss out on other activities such as social, physical, intellectual and emotional development or on other beneficial activities available on campus. Studies have shown that high usage of the Internet may lead to problems such as physical problems, poor academic performances, less social interaction with the people in an offline environment and so forth.

Empirical evidence that associates the amount of usage and adverse effects is still lacking. Future research should strive to provide such evidence and eventually suggest solutions to the problems. Other factors that could contribute to Facebook addiction should also be explored. This is because the regression model tested in this study, although significant, could explain only 20% of variance in Facebook addiction. Future research should search for other possible factors in order to better understand Facebook addiction.

APPENDIX

Table 1: *Amount of time spent on Facebook.*

Variables	Mean	S.D
Time spent on Facebook (The day before they participated in the survey)	4.69	2.61
Time spent on Facebook (On a typical day)	5.35	2.75
Total Mean: 5.02		
Standard Deviation: 2.58		

Note: Time spent measured in hour, *N* = 400

Table 2: *Distribution of respondents according to dimensions of Facebook addiction*

Variables	Mean (S.D.)	Total Mean (S.D)
'I noticed that'		
Intrusion (N=400)		4.09 (.417)
I lose track of time when I am using FB	4.08 (.601)	
I stay on FB longer than I intended	4.09 (.583)	
I neglect assignments to spend more time on FB	3.76 (.705)	
I check FB before doing other things on the Internet	4.28 (.597)	
I would be more productive without using FB	4.17 (.631)	
I would enjoy more hobbies without using FB	4.04 (.695)	
I try to cut down the amount of time I spend on FB but fail to do so.	4.19 (.683)	
I lose sleep due to late night logins	4.12 (.746)	
I say "Just a few more minutes" to myself when on FB	4.36 (.661)	
I am spending more time on FB	3.89 (.852)	
Escaping Reality (N=400)		4.16 (.487)
I have to block out disturbing thoughts when using FB	4.06 (.745)	
Others complain about the amount of time I spend on FB	3.79 (.858)	
I can form new relationships online	4.35 (.618)	
I feel annoyed if others bother me when I am on FB	4.22 (.732)	
I am using FB to foster intimacy with friends and family	4.40 (.622)	
I feel preoccupied with FB even when offline	4.14 (.771)	
I find myself anticipating using FB	4.17 (.749)	
Attachment (N=400)		4.07 (.660)
I cannot imagine living without FB	4.11 (.819)	
I miss FB so much when I am unable to use it	4.10 (.810)	
I feel upset if I cannot use Facebook	3.99 (.844)	

Table 3: *Factor loading for gratifications sought.*

Factors	Loading	Eigenvalue	Variance
Factor 1: Content Gratifications (N=400) 'Facebook helps me'		4.646	25.812
Provide information.	.696		
To share useful information with other people.	.787		
To present information on my interests.	.815		
Factor 2: Process Gratifications (N=400) 'I use Facebook because'		2.190	12.165
It is entertaining.	.818		
It is the most cost-effective way to publicise.	.606		
Factor 3: Self-presentation (N=400) 'I use Facebook because'		1.429	7.940
I want to tell others about myself.	.871		
I want to show my personality.	.778		
I like a place where I can post things that I want to say immediately.	.660		
Factor 4: Technology Gratifications (N=400) 'I use Facebook because'		1.340	7.446
I can get what I want for less effort.	.669		
I can use it anytime.	.609		
Factor 5: Social Gratifications (N=400) 'Facebook helps me'		1.197	6.652
To meet new people	.858		
To connect with persons who share my values	.665		

*Total variance explained = 60%

Table 4: Factor loading for personality characteristics.

Factors	Loading	Eigenvalue	Variance
Factor 1: Locus of control (Powerful others control) (N=400)		4.121	14.716
My life is chiefly controlled by powerful others	.830		
I feel like what happens in my life is mostly determined by powerful others.	.791		
People like me have very little chance of protecting our personal interests when they conflict with those of strong pressure groups.	.775		
In order to have my plans work, I make sure that they fit in with the desires of people who have power over me.	.675		
Factor 2: Locus of control (Internal control) (N=400)		3.112	11.116

Continue Table 4

I can pretty much determine what will happen in my life.	.818		
I am usually able to protect my personal interests	.819		
My life is determined by my own actions.	.795		
Factor 3: Shyness (N=400)		2.342	8.366
I have trouble looking someone right in the eyes	.802		
I feel inhibited in social situations.	.743		
I am shy with members of the opposite sex.	.670		
It is hard for me to act natural when I am meeting new people.	.601		
Factor 4: Loneliness (N=400)		1.658	5.923
I feel isolated from others.	.789		
I am no longer close to anyone.	.733		
I lack companionship.	.727		
Factor 5: Locus of control (Chance control) (N=400)		1.419	5.067
Often there is no chance of protecting my personal interests from unforeseen happenings.	.755		
I have often found that what is going to happen will happen.	.764		

*Total variance explained = 45%

Table 5: Zero order correlation and partial correlation between gratifications sought and Facebook Addiction,, and between personality characteristics and Facebook addiction.

	Zero-order correlation (N=400) <i>r(p)</i>	Partial correlation controlling Facebook exposure (N=400) <i>r(p)</i>
Gratifications Sought (N=400)		
Content	.272(.000)	.242(.000)
Process	.251(.000)	.264(.000)
Self-presentation	.292(.000)	.254(.000)
Technology	.125(.006)	.141(.002)
Social	.261(.000)	.221(.000)
Personality characteristics (N=400)		
Shyness	.218(.000)	.162(.001)
Loneliness	.247(.000)	.181(.000)
Powerful others control	.140(.002)	.104(.019)
Chance control	.065(.097)	.087(.041)
Internal control	-.031(.271)	-.018(.362)

**correlations are significant at $p < 0.005$

Table 6: Multiple regression analyses for the contributing factor to Facebook addiction.

Variables	Facebook Addiction <i>β(p)</i>
Gratifications Sought (N=400)	

Content	.168 (.001)
Process	.116 (.021)
Self-presentation	.159 (.002)
Technology	.011 (.821)
Social	.112 (.024)

Personality characteristics

(N=400)

Shyness	.129 (.008)
Loneliness	.168 (.001)
Powerful others control	.043 (.383)
Chance control	-.017 (.716)
Internal control	-.024 (.607)

R ²	.227
Adjusted R ²	.207
F	11.404
Sig.	.000

N= 400, *p< .05, **p< .001

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