Measuring the negative effects of the Facebook dependence on the students' university work

Gabriel Gorghiu
Valahia University Targoviste
Bd. Carol I, Nr.2, Targoviste, Romania
ggorghiu@gmail.com

Valentina Iuliana Manea
Technical University of Civil Engineering Bucharest
Bd. Lacul Tei, Nr.124, Bucharest, Romania
m.valentina70@yahoo.ro

Dragoş Daniel Iordache, Costin Pribeanu
National Institute for Research and Development in Informatics - ICI Bucharest
Bd. Maresal Averescu, nr.8-10, Bucharest, Romania
{iordache, pribeanu}@ici.ro

ABSTRACT
Recent research on the use of social networking websites reveals an intense use of Facebook that may cross the boundaries between use and abuse and may lead to dependence. The objective of this paper is to analyze the relationship between the Facebook dependence and the negative consequences of the excessive use of Facebook on the students' university work. An associated objective is to adapt and test two sub-scales measuring the withdrawal syndrome and the negative effects on the university work. The results of two empirical study that used samples from two Romanian universities show a significant positive correlation between the Facebook dependence and its negative effects on the work of students.

Author Keywords
Social networking websites, Facebook, Facebook use and abuse, negative effects of social networking websites.

INTRODUCTION
Recent research on the use of social networking websites, in general, and Facebook, in particular, shows that Romanian university students have very large Facebook networks, log on several times each day (or they are continuously logged on), and spend a lot of time, daily [11, 13]. Several studies reveal an intense Facebook use that may cross the boundaries between use and abuse. The fact that the overuse of the social networking websites may lead to negative effects upon students' work has been widely researched in the last years [3, 16]. Several measurement scales exist that aim to capture the key dimensions of the addictive behavior related to the use of Internet. Many conceptualizations are featuring multidimensional models that include a diversity of constructs, such as: withdrawal syndrome, salience, tolerance, overuse, negative effects on work, or mood modification [1, 9, 14, 15].

The objective of this paper is to measure and analyze the relationship between the Facebook dependence and the negative consequences of the excessive use of Facebook on the university work of students. Facebook dependence was measured with the withdrawal syndrome scale [14]. For the negative consequences, the scale developed by Masur et al. [14] has been used. An additional objective of the paper is to validate these scales on two samples of Romanian university students.

The rest of this paper is organized as follows: The following section presents related work in the area of social networking websites with a focus on the Facebook dependence and associated negative effects on the educational activities. In section 3, the empirical study is presented. The paper ends with discussion and conclusion.

RELATED WORK

Negative effects of social networking websites
The use of social networking web-sites in the educational context is widely researched in the last years. The Facebook popularity among university students raised several research questions, as regards its educational potential [5, 13]. Nevertheless, there are many studies revealing not only positive, but also negative effects of social networking websites [1, 3, 8]. Young people spend a lot of time on Social Networking Sites (SNS), and this can cause them to become potential addicts. SNS addiction has been defined as a failure to control usage, which leads to negative personal outcomes [12].

Orosz et al. [15] consider that Facebook intensity can be distinguished from Facebook habits - time spent on Facebook, number of Friends, and number of group memberships - because the latter does not necessarily reflect on the emotional connectedness to Facebook use. They distinguish Facebook addiction from Facebook intensity in terms of pathology: Facebook intensity is not necessarily a problematic behavior, however it is not true for Facebook addiction [1, 14].

Masur et al. [14] consider that the interplay of intrinsic need satisfaction in the offline context and the motives of SNS use is a crucial driver of SNS addiction. They argue that people experiencing shortcomings in intrinsic need fulfilment in their daily offline-lives try to compensate for these deficits online through the gratifications of SNS use. It was hypothesized that motives mediate the influence of thwarted intrinsic need satisfaction on addictive behavior on SNSs. More precisely, a lack of autonomy leads to a higher motivation to use SNSs for self-presentation and escapism, a lack of competence predicts the motive to use SNSs for acquiring information and self-presentation, and a lack of relatedness fosters users' motives to use SNSs for self-presentation and meeting new people. Those motives were hypothesized to be associated with higher levels of SNS addiction.

Facebook use and abuse
It is difficult to define the boundary between the use and

abuse of social networking websites. Elisson et al. [5] developed a composite measure for the Facebook intensity that aims to combine characteristics of use with attitudinal items. Although it is not unidimensional, it has been widely used in the last decade [15].

Due to the fact that Facebook addiction is an emerging field, different researchers have taken varying approaches to the measurement of this potential disorder. An adapted version of the Internet Addiction Scale by Hahn and Jerusalem [9] was used to measure SNS addiction. The wording of the 20 items of the original scale was modified to fit the context of SNS usage, in this case Facebook in specific. The items cover the five central dimensions of addiction:

- loss of control;
- tolerance;
- withdrawal syndrome;
- negative consequences for social relations;
- negative outcomes for work and performance.

Each dimension is measured with four items to which Participants responded on a 5-point Likert scale ranging from 1 “strongly disagree” to 5 “strongly agree”. The results emphasize the importance of incorporating both offline need satisfaction and gratifications sought through the use of SNS to provide a comprehensive perspective on addictive behavior on SNSs.

The Caplan’s social skill model of generalized problematic Internet use [4], states that individuals who prefer to communicate in an online environment are at greater risk of experiencing negative outcomes related to excessive online use. Those individuals, who demonstrate deficient self-regulation of Internet use, tend to engage in online social communication as a means of escaping from negative mood states, such as loneliness or anxiety.

Wilson, et al. [17] developed the Addictive Tendencies Scale, which has three items reflecting salience, loss of control, and withdrawal. Although these three aspects have been central in thinking about addictions, in the literature, addiction has involved six core components: (1) salience - the activity dominates thinking and behavior; (2) mood modification - the activity modifies/improves mood; (3) tolerance - increasing amounts of the activity are required to achieve previous effects; (4) withdrawal - the occurrence of unpleasant feelings when the activity is discontinued or suddenly reduced; (5) conflict - the activity causes conflicts in relationships, in work/education, and other activities; and (6) relapse - a tendency to revert to earlier patterns of the activity after abstinence or control (Griffiths, 1996, 2005).

The Bergen Facebook Addiction Scalewas created by Andreassen et al. [1] with the aim to assess the respondents' level of addiction to Facebook with respect to the six components of addictions (salience, tolerance, mood modification, relapse, withdrawal, conflict). The scale contains six items representing the six factors and respondents had to answer using a 5-point scale (1= very rarely; 2= rarely; 3 = sometimes; 4 = often; 5 = very often).

Ross et al. [16] created a Facebook Questionnaire which contained three factors; one of them was the Online Sociability Scale which assessed the individuals' engagement in Facebook activities in terms of posting, messaging or commenting on photos on a scale ranging from 1 (more than once daily) to 9 (less than once per year).

The Multidimensional Facebook Intensity Scale was developed by Orosz et al. [15]. Their study points to the facets of the emotional connectedness. The scale has four dimensions: persistence, boredom, overuse, and self-expression. The third factor seems related to the Facebook dependence although it also taps on some negative effects of the overuse. The differentiated Facebook intensity facets can batter predict the frequent Facebook-related behaviors as liking and posting than previous measures [15].

EMPIRICAL STUDIES

Conceptualization

The objective of this study is to measure and then to analyze the relationship between two latent variables: the Facebook dependence (AWS) and its negative effects on the students’ university work (ANC). The operationalization of constructs is based on the related work in the literature. For the AWS and ANC constructs, the items have been adapted from the existing sub-scales of Masur et al. [14]. The items for the two constructs are presented in Table 1.

Item	Description
AWS1	If I am off Facebook for a longer period of time I feel nervous
AWS2	When I am not online I ask myself what happens on Facebook
AWS3	I feel out of touch when I haven't logged onto Facebook for a while
ANC1	I am regularly on Facebook while being at university
ANC2	My concentration at university suffers because I am on Facebook
ANC3	I often neglect my university work because of Facebook

Table 1. Variables.

It is hypothesized that a significant positive correlation exists between the Facebook dependence and the negative consequences of the excessive use of Facebook on the university work of students.

Method

The normality of variables was checked by using SPSS for Windows. In order to assess the two scales, a confirmatory factor analysis (CFA) using structural equation modeling (SEM) approach was taken. The model has been tested

with AMOS 7.0 for Windows [2], using the maximum likelihood estimation method.

Convergent validity has been assessed by examining the loadings and their statistical significance through *t*-values, the construct reliability (composite reliability), and the average variance extracted. The scale reliability has been analyzed checking the magnitude of Cronbach's alpha.

Factor loadings of all standardized items should be greater than 0.50, ideally exceed 0.7. Item reliability indicating the amount of variance should be greater than 0.50. Composite reliability (CR) measuring the internal consistency of a construct should be at least 0.60 (preferrably grater than 0.7) [6]. The average variance extracted (AVE) measuring the amount of variance captured by the construct should be greater than 0.50 [10].

The model testing results are analyzed based on the GOF (goodness-of-fit) indices recommended by Hair et al. [10].

Participants and samples

Two samples that have been collected in 2015, being used in this study.

The first sample includes 204 students from the Valahia University Targoviste (114 men and 90 women). The age is varying between 19 and 52 years with a mean of 25.89 (SD=7.68). Most of the students are undergraduates (71.1%).

The network size has a mean value of 641.13 (SD=801.94. From the mean number of FB friends 219.67 (48.60%) are students and 74.90 (11.53%) are studying in this university. The number of Facebook logs / day (self-assessed) is measured on a four-point scale (1 = once, 2 = twice, 3 = three times, and 4 = continuous log). The mean number of the logs / day is 2.73 (SD=0. 94) and the time spent in minutes / day is on average 71.24 (SD=80.86).

The second sample includes 227 students (129 men and 98 women) from a Technical University of Civil Engineering in Bucharest. The participants were asked to answer some general questions then to rate the items on a 7-point Likert scale. All participants except for two are undergraduates.

After checking the multivariate outliers two observations were eliminated so the final working sample has 225 observations. The age of participants is varying between 18 and 39 years with a mean of 20.95 (SD=2.36). Almost all students are undergraduate (except for two).

The mean network size (number of Facebook friends) is 856.93 (SD=866.18. The mean number of the logs / day is 3.05 (SD=0. 82) and the time spent in minutes / day is on average 79.73 (SD=106.09).

As it could be noticed, university students have large Facebook networks and spend a lot of time on Facebook.

Model estimation results

The examination of item loadings revealed that all except one (ANC1) are above the cut-off value of 0.6. A closer look at ANC1 makes it difficult to ascertain if the statement is a cause or an effect of underlying construct. Therefore, it has been decided to eliminate ANC1 and to test again the model. The descriptive, item loadings, scale reliability, and convergent validity criteria are presented in Table 2.

Item	M	SD	Loadings	Alpha	CR	AVE
AWS1	2.42	1.92	1.920	0.909	0.909	0.769
AWS2	2.86	1.96	1.960			
AWS3	2.67	1.96	1.960			
ANC2	2.93	2.13	0.840	0.842	0.845	0.732
ANC3	2.59	1.93	0.871			

Table 2. Descriptive, loadings and convergent validity (N=204)

The unidimensionality, scale reliability, and convergent validity criteria are very good. The mean values suggest a moderate Facebook dependence and moderate negative effects.

The model testing results are presented in Figure 1. There is a significant ($p<0.001$) positive correlation between the Facebook dependence and the negative consequences on the work of students.

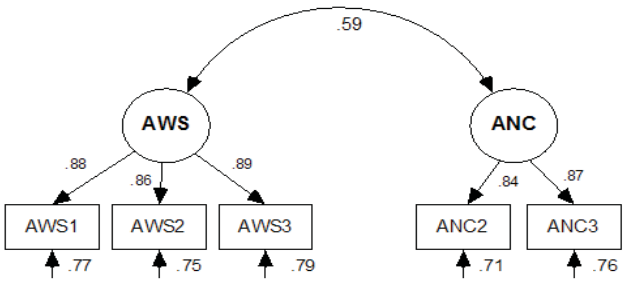

Figure 1. Model testing results (N=204).

The results revealed an excellent fit of the model with the data: $\chi^2 = 6.27$, DF = 4, $p = 0.180$, $\chi^2/DF = 1.568$, TLI = 0.991, CFI = 0.96, SRMR = 0.016, RMSEA = 0.053.

Cross validation

Since the ANC scale has been modified, a cross-validation on a different sample is mandatory.

The descriptive, item loadings, scale reliability, and convergent validity criteria are presented in Table 3.

Item	M	SD	Loadings	Alpha	CR	AVE
AWS1	2.38	1.77	0.800	0.877	0.852	0.743
AWS2	2.57	1.83	0.857			
AWS3	2.62	1.91	0.865			
ANC2	2.74	1.92	0.790	0.844	0.845	0.732
ANC3	2.36	1.75	0.928			

Table 3. Descriptive, loadings and convergent validity (N=225).

The unidimensionality, scale reliability, and convergent validity criteria are also very good for the second sample. The mean values (a little bit lower than for the first

sample) suggest a moderate Facebook dependence and moderate negative effects.

The model testing results are presented in Figure 2. There is a significant ($p<0.001$) positive correlation between the Facebook dependence and the negative consequences on the work of students.

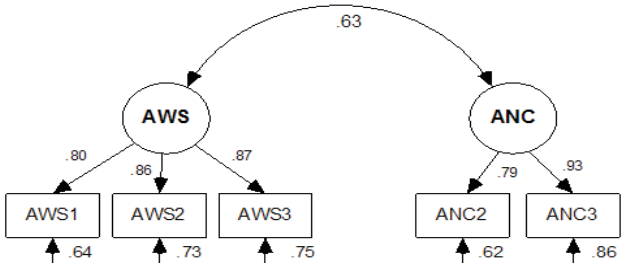

Figure 2. Model testing results (N=225).

The results revealed a very good fit of the model with the data: χ^2=8.45, DF=4, p=0.076, χ^2/DF=2.113, TLI=0.982, CFI=0.993, SRMR = 0.022, RMSEA=0.070.

The cross-validation results confirm the hypothesis on the second sample.

DISCUSSION AND CONCLUSION

The results of the two empirical studies show a moderate level of Facebook dependence. Clearly, the Facebook dependence has negative effects on the students' university work. The results of this study have some implications for researchers and practitioners.

Two constructs adapted from the literature have been used to measure the withdrawal syndrome and the negative consequences on the work. AWS has been validated on both samples and exhibits unidimensionality and very good convergent validity. As regards the second construct, only two items have been used in order to ensure a good psychometric quality.

Those findings come in correlation with the general trend - already discussed in various research demarches and also spread in mass-media, being obvious that technology is mainly consumed in the format of social networks by students, and they spend most of their entire time staying on-line or plugged-in. The actual devices (smartphones, tablets) have an essential role to this fact. In this sense, it can be said that social networks became a kind of extension of the students' own *egos*. Practically, letting them without virtual networking seems to lead to losing of an important part of themselves.

Anyway, the Facebook dependence - measured with the withdrawal syndrome - is not the only determinant of the negative consequences on students' work. In a large amount, most of the interviewed students are connected to Facebook during the day. They admitted they had spent hours and hours taking a look to their friends' pictures, posting and answering to various comments, staying on chat and sending instant messages. Consuming a big amount of time on those activities means that the students do not have more on doing their tasks or preparing their exams. This time spent on Facebook has an important weight on the university students' time budget. Also, the high frequency of use is a factor that distracts the students and negatively impacts their concentration on work.

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