

The development of Problematic Use of Social Network Scale

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Abstract

In current study we aim to develop a valid and reliable scale in measuring problematic use of social network. Current research was conducted with validity and reliability studies. To determine construct validity we run confirmatory factor analyses by using AMOS. The results indicate that the scale has a good fit for measurement. Cronbach alpha, item-total correlations and factor loadings show that the scale has sufficient values. And lastly, criterion-validity studies were conducted with Internet Addiction scale, Online Cognition Scale and Depression, Anxiety and Stress Scale. Results indicate significant and positive correlations between Problematic Social Network Use Scale and these scales. As a conclusion results demonstrate that Problematic Social Network Use Scale is a valid a reliable measure and can be used in different samples.

Keywords: Problematic, social network use, internet use

Social network sites (SNSs) have basically served as the online communication tools. SNSs, such as Facebook and MySpace, are member-based Internet communities that allow users to create personalized profiles, control what profile information is presented, interact with other members and post information about themselves on their profiles. With the increased attention to the SNSs, there is no specific instrument to measure the problematic use of SNSs when the literature was examined. Even if some studies developed instruments to measure Facebook addiction (Andreassen, Torsheim, Brunborg, & Pallesen, 2012, Koc & Gulyagci, 2013), there is no tool to measure the problematic use of general SNSs. For that aim, we want to develop a scale to measure problematic use of SNSs.

Boyd and Ellison (2007) define SNSs as “web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system.” SNSs has not only changed the nature of social relationships, but also provided opportunities for individuals to show themselves, share articles, and establish or maintain relationships with others (Boyd, & Ellison, 2007; Ellison, Steinfield, & Lampe, 2007). There is some controversy as to whether one may integrate different Internet-related problems (e.g., excessive pornography use/gaming/surfing/social networking) into one category named "Internet addiction" since it remains unclear whether the underlying mechanisms responsible for the addictive behavior are the same for these different problems (Holden, 2001). This raises the additional question of what people are addicted to is the internet or on the Internet (Griffiths, 2000).

Many research has found that psychological traits such as low self-esteem, shyness (Armstrong, Phillips, & Sailing, 2000; Davis, 2001; Kim, & Davis, 2009; Niemz, Griffiths, & Banyard, 2005; Griffiths & Dancaster, 1995; Lavin, Yuen, Weinman, & Kozak, 2004), poorly adapted person: introvert (Amichai-Hamburger, Wainapel, & Fox, 2002; Shotton, 1991; Cao & Su, 2006; Griffiths and Dancaster, 1995), sadness, anxiety (Kim et al., 2006; Young, 1998), neuroticism (Cao & Su, 2006), a high sense of loneliness and sadness (Lavin et al., 2004; Kim, & Davis, 2009; Nicpon et al., 2006; Pawlak, 2002; Whang, Lee, & Chang, 2003), social retreat (Griffiths and Dancaster, 1995), attack, poor self-control and neuroticism (Kim, Namkoong, Ku, & Kim, 2008), maladaptive self-regulatory strategy (LaRose, Lin, & Eastin, 2003; Spada, Langston, Nikčević, & Moneta, 2008); prone to social dis-inhibition (Niemz, Griffiths, & Banyard, 2005); high on neuroticism (Ehrenberg, Juckes, White, & Walsh, 2008) are all significantly correlated with problematic internet usage. Kandell (1998) indicated that making the Internet and its social functions an overly central part of their lives puts college

students' developmental stage of solidifying their sense of identity and forming meaningful and intimate relationships at risk.

Researchers have conceptualized the addiction to SNSs as Internet spectrum addiction disorders (Karaïskos, Tzavellas, Balta, & Paparrigopoulos, 2010). People spend a lot of time online, and this can cause them to become potential addicts. However, they are not addicted to the media itself since some users may develop addictions for not all media but specific Internet activities (Griffiths, 2000). In this point, an important question needs to be answered: How can we measure problematic social network use?

The aim of the present study is to develop a scale to be used in future research. An examination of the first psychometric findings related to the validity and reliability of the measurement tool in question, the Problematic Use of Social Network Scale (PUSNS), forms the main axis of the research.

Method

Participants

In the first phase, confirmatory factor analysis, we studied a total of 201 university students (146 male subjects). Students who feel that they have problems with their family, friends, and social environment because they use SNSs most of their days applied to get help from researchers. They state that they have problems in their lesson, and social and private lives and their family and friends suggest that they need counseling. In counseling sessions for 1.5 years, they participated to study as a volunteer. In the second phase, calculating Cronbach alpha, 246 university students (135 male subjects) participated in the study as a volunteer. In the third phase, calculating item-total correlations, 178 university students (89 male) participated in the study. In the fourth phase, criterion-validity study, our study sample consists of 289 university students (113 male subjects). In the fifth phase, for test-retest reliability study, we studied a total of 157 university students (78 male subjects).

Data Collection

Online Cognitions Scale: This scale was developed by Davis, Flett, and Besser (2002) and adapted into Turkish by Ozcan (2004). The aim of developing this scale is to measure online cognitions on the Internet. The scale consists of 36 items and four subscales: social comfort, loneliness-depression, diminished impulse control, and distraction. Test-retest

correlation coefficient was found to be 0.90, and internal consistency of scale was determined as 0.93.

Internet Addiction Scale: The scale was developed by Cheng, Weng, Su, Wu and Yang (2003) and adapted into Turkish by Kesici and Sahin (2010) Consists of 26 items and 5 sub-dimensions (compulsive use, withdraw, tolerance, time management, interpersonal and health problems). The scale aims to measure the features of Internet addiction. The internal reliability score of the scale was 0.94. The internal consistency scores for each subscale calculated were found to be 0.86 for compulsive use, 0.90 for withdraw, 0.91 for tolerance, 0.89 for time management problem, and 0.91 for interpersonal and health problems. Item-total correlations ranged from 0.64 to 0.86 for the 26 items.

Depression, Anxiety and Stress Scale: The scale was developed by Lovibond and Lovibond (1995), and Akin and Cetin (2007) adapted this scale into Turkish. It consists of 42 items with 3 subscales. After factor analysis in Turkish adaptation study, it has found 3 subscales same as the original scale, and factor loadings change between 0.39 and 0.88. Cronbach alpha coefficient was found to be 0.89, and item-total correlations were found to be between 0.51 and 0.75. Test-retest and split half coefficients were found to be 0.99 and 0.96.

Procedures

For 2 years, researchers create an item pool via university students who consult researchers for counseling. Students who think that they have some problems in their daily and social life because of social network use applied to obtain counseling. They wanted to obtain help and state that SNSs create problems in their lessons, grades, social and daily lives, and relationships with others. During counseling sessions, the researchers create items according to their statements about SNSs. Then, these items were presented to professionals in Internet addiction 5 psychologists and 5 psychiatrists. Items that were accepted by 4 of 5 professionals were selected for scale.

Data Analysis

The data were analyzed using SPSS 15.0 and AMOS CFA was administered to test this structure. The model that had been formed by using CFA was tested using Amos program. For criterion-validity Pearson's correlation analysis was used.

Findings

The scale showed a two-dimensional structure based on the conducted CFA results. Some goodness-of-fit values were calculated and examined to find out to what extent the tested model fits with the available data.

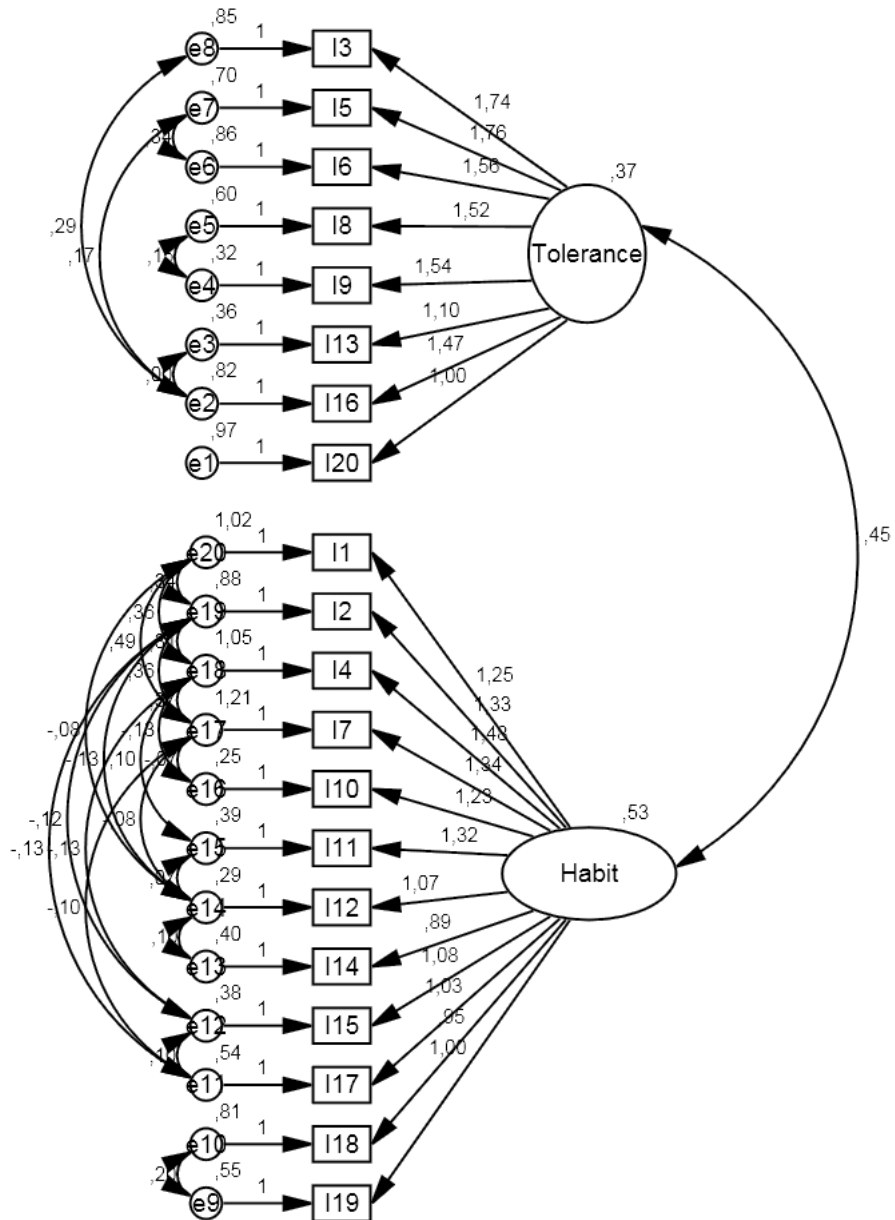


Figure1. CFA results related to Two-Factor Solution n= 201; $p < 0.001$; $\chi^2/Sd = 2.217$

After CFA result, obtained modification index values were examined, and correlations between some proper item errors were released to obtain better goodness-of-fit indexes (Figure 1). Modification indices show the decrease that will be obtained in chi-square value as a result of adding a constant parameter or new parameters (Sumer, 2000). After proper modifications had been carried out, CFA was retested. The goodness-of-fit values obtained from the last model are summarized in Table 1. When the values in Table 1 are examined, generally, it is understood that the model has acceptable goodness-of-fit indexes (Bollen, 1989; Browne & Cudeck, 1993; Byrne, 2010; Hu & Bentler, 1999; Kline, 2011; Tanaka & Huba, 1985). The tested two-factor model is shown in Figure 1.

Table 1

Goodness-of-fit values obtained from CFA Analysis of Problematic Use of Social Network Use Scale

	χ^2/df	RMSEA	SRMR	CFI	IFI	GFI	AGFI
Acceptable Goodness-of-fit Values	≤ 5	≤ 0.8	≤ 0.8	$\geq 0,95$	$\geq 0,90$	$\geq 0,90$	$\geq 0,85$
Goodness-of-fit Values of the Model	2.217	0,005	0.004	0.091	0.091	0,994	0,995

In the scale, the items' factor loadings change between 0.53 and 0.87, the factor loadings in tolerance dimension change between 0.53 and 0.86, and the factor loadings in habit dimension change between 0.61 and 0.87. (see Table 2) All the ways shown on the model are found to be significant to 0.001 degree. Cronbach alpha for the total scale was found to be 0.92.

Table 2

Factor Loadings and Item-total correlations of Problematic Use of Social Network Scale

Items	Factor Loadings		Item-Total Correlations
	F1	F2	
I3	.754		.783
I5	.788		.833
I6	.717		.751
I8	.768		.773
I9	.859		.833
I13	.744		.677
I16	.705		.747
I20	.526		.492
I1		.668	.720
I2		.717	.725
I4		.723	.744
I7		.663	.689
I10		.874	.817
I11		.837	.792
I12		.821	.766
I14		.714	.683
I15		.787	.730
I17		.714	.664
I18		.609	.583
I19		.700	.671

Note: F1: "Tolerance" 8 items F2: "Habit" 12 items

Additionally, three significant criteria were used in the process of interpretation and formation of latent variable analysis. First, Kline's (2011) warning about the multi-dimensional scales was taken into consideration as the PUSNS is a multi-dimensional scale; the number of the observed variable (item) that explains the latent variable (factor) was determined to be at least 2. Second, estimating that a predetermined theoretical model is tested, the items having the highest parameter estimates, that is, high lambda ($\lambda > 0.50$) value,

which determines the factor value; high t value, which indicates the meaning of the relations; and high multi correlation square ($R^2 > 0.30$) that can be used as validity index were primarily preferred in a lateral variant. Third, the models having an item loaded on more than one latent variable (crossloadings) were not preferred to form conceptual clarity. In short, while improving the PUSNS, the used theoretical structure and explanatory factor analysis and statistical results were taken into consideration; the items that explain the consisted latent variables best were determined, and the required changes were made on the model according to CFA with the aim of increasing the construct validity of the PUSNS.

According to the criterion-based validity study results, there are considerable relations between the problematic use of social network and cognitive state on the internet scale, internet addiction scale, and anxiety and stress scale. Based on Pearson correlation analysis of problematic use of social network analysis with cognitive state on Internet scale results, a positive relation was observed between the *tolerance* of PUSNS and *social comfort* ($r = 0.36$, $p < 0.01$), *loneliness* ($r = 0.40$, $p < 0.01$), and *diminished impulse control* ($r = 0.43$, $p < 0.01$). A positive relation is observed between *habit* and *social comfort* ($r = 0.35$, $p < 0.01$), *loneliness* ($r = 0.39$, $p < 0.01$), and *diminished impulse control* ($r = 0.41$, $p < 0.01$).

Based on the correlation analysis results between PUSNS and internet addiction scale, considerable and positive relations were observed between *tolerance* –sub dimension of PUSNS- and *compulsive use* ($r = 0.33$, $p < 0.01$), *withdraw* ($r = 0.35$, $p < 0.01$), *tolerance* ($r = 0.44$, $p < 0.01$), *time management problems* ($r = 0.28$, $p < 0.01$), and *interpersonal and health problems* ($r = 0.35$, $p < 0.01$) –sub dimensions of Internet addiction scale-. Also, positive and considerable relations were found between *habit* and *compulsive use* ($r = 0.39$, $p < 0.01$), *withdraw* ($r = 0.28$, $p < 0.01$), and *tolerance* ($r = 0.37$, $p < 0.01$).

Based on the results of correlation analyses carried out via depression anxiety and stress scale, there are positive and meaningful relations between *tolerance* and *depression* ($r = 0.17$, $p < 0.05$), *anxiety* ($r = 0.19$, $p < 0.05$), and *stress* ($p < 0.05$), as well as between *habit* and *depression* ($r = 0.15$, $p < 0.05$) and *stress* ($r = 0.20$, $p < 0.05$).

Discussion and Conclusion

In the current study, we aim to develop PUSNS by conducting validity and reliability analysis. For the validity of scale, we run confirmatory factor analysis (CFA), and results indicate that the scale has 20 items and 2 subscales named as tolerance and habit. CFA results show that the model has a good fit ($\chi^2/df = 2.21$, RMSEA = 0.05, SRMR = 0.004, CFI = 0.91, IFI = 0.91, GFI = 0.99, and AGFI = 0.99). In a model, GFI and AGFI values greater than 0.95

means that the model has a good fit (Hooper, Coughlan, & Muller, 2008). Also, chi-square/degrees of freedom (df) ratio less than 3 indicate a perfect fit in a model. In evaluating RMSEA, Steiger (2007) indicates that RMSEA for 0.07 or lower is an acceptable level. Hu and Bentler (1999) state that 0.06 or lower is an acceptable level. All these statements show that the factor structure of PUSNS can be a valid scale in measuring problematic use of social network.

Factor loadings are changed between 0.53 and 0.87, although these loadings in dimension of tolerance change between 0.53 and 0.86. In habit dimension, these loadings change between 0.61 and 0.87, which is also an acceptable level for the scale. Item-total correlation coefficients for PUSNS range between 0.49 and 0.83. Cronbach alpha for the total scale was found to be 0.92. These results also refer to a reliable measurement for future studies.

In criterion-validity study, we found significant and positive correlations between PUSNS and Internet Addiction scale, Online Cognition Scale and Depression, and Anxiety and Stress Scale. We found significant and positive correlations between tolerance and compulsive use, withdraw, tolerance, time management problems, and interpersonal and health problems. Also, there were significant and positive correlations between habit and all subscales of Internet Addiction Scale (IAS). There are numerous studies about problematic Internet use (Davis et. al, 2002; Caplan, 2002, 2006; Shapira, Goldsmith, Keck, Khosla, & McElroy, 2000) and Internet addiction (Beard & Wolf, 2001; Chou & Hsiao, 2000; Young & Rogers, 1998). For example, in a study of Kesici and Sahin (2010), significant and positive correlations were found between Internet Diagnostic Questionnaire (IDQ) and Internet Addiction Scale similar to our findings for criterion-validity. In another study of Caplan (2002), problematic internet use was found to be significantly correlated to psychosocial health variables. In his other study (2003) he reveals that social interaction has an important role in the development of negative consequences of problematic Internet use. This can also be explained with the result of correlation between these variables. We also found that PUSNS is positively correlated with Online Cognition Scale. In both subscales, PUSNS is positively correlated with online cognition subscales such as social comfort, loneliness, and diminished impulse control. Shaw and Gant (2004) discovered that Internet use was found to increase perceived social support, which is also a similar to our findings. In analysis between PUSNS and depression, anxiety and stress Scale, we found significant correlations between these variables. There are positive correlations between both dimensions of PUSNS and depression, anxiety and stress scale according to results. There exist various studies that

reveal the relation between problematic Internet use and depression (Ceyhan & Ceyhan, 2008; Morrison & Gore, 2010; Park, Hong, Park, Ha, & Yoo, 2013; Young & Rogers, 1998) and social anxiety (Caplan, 2006; Lee & Stapinski, 2012). For example in Ceyhan and Ceyhan (2008), study depression was found to be a significant predictor of problematic Internet use. Young and Rogers (1998) found significant relations between depression and pathological Internet use. These results are similar to our findings. However, these are the studies about problematic Internet use and Internet addiction, which is different from our findings because there is no scale and study about problematic social network use.

As a result, despite obvious advantages of online social networking (Shaw & Gant, 2002), there is also evidence of its addictive potential, leading to a variety of psychological and social problems (Amichai-Hamburger et al., 2002; Ehrenberg et al., 2008; Wilson, Fornasier, & White, 2010). In this point we aimed to develop a scale to measure the problematic social network use. This helps researchers and practitioners in defining problematic social network use and helping people who have problems in their daily and social lives. For these reasons, this is an original article because of the need for a scale that measures problematic social network use and the first study in this subject.

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