Problematic Use of Social Networking Sites: The Role of Self-Esteem

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ABSTRACT

Social networking sites (SNSs) are a flourishing component of the Internet, with enormous potential for growth. The distinctive social-oriented features of social networking platforms provide a pleasant social interaction experience for users. This pleasant experience tends to encourage individuals to continue using these platforms excessively without their knowledge, and thus results in problematic use behaviors and negative outcomes in different aspects of life. In view of the increased attention to the issues of problematic use of social networking sites and their relation to psychological well-being variables, the main objective of this paper is to investigate how self-esteem affects the development of problematic Internet use in the context of social networking sites. The authors integrated self-esteem as a hypothesized antecedent into the model of generalized problematic Internet use and empirically tested the model with 200 Facebook users. Structural equation modeling analysis confirmed that low self-esteem predisposes individuals to develop a preference for online social interaction (POSI). This preference and the use of social networking sites to regulate mood in turn predict deficient self-regulation and result in negative outcomes. The paper concludes with a discussion of practical and theoretical implications.

Keywords: Social networking sites, problematic Internet use, addiction, self-esteem, psychological well-being
1. INTRODUCTION

As the popularity of the Internet has grown so have concerns about its problematic use. The term Internet addiction disorder was coined by Ivan Goldberg [1995], who ignited tremendous attention and debate for more than a decade. Internet addiction disorder has been extensively studied, with researchers adopting different perspectives, definitions, theories, and measurement instruments in their investigations. O’Reilly [1996] and Young [1996] were among the first scholars to conduct rigorous academic studies on the concepts related to Internet addiction disorder. They defined the term using the frameworks of substance abuse and pathological gambling. In recent years, researchers have begun to focus on the subtypes of Internet-based problems, such as online sex compulsivity, Internet gambling, online gaming addiction, and problematic instant messaging [Armstrong, Phillips, and Saling, 2000; Griffiths, 2000; Lu and Wang, 2008; Rutland, Sheets, and Young, 2007].

Although Internet addiction has received continuous attention from the press, academics, and the general public, it has not yet been officially considered a mental disorder nor included in the fourth edition of Diagnostic and Statistical Manual of Mental Disorders (DSM-IV). In the current study, we use the term problematic use and study the problematic use of the Internet in the context of social networking sites (SNSs). Young [1998] indicated that the Internet itself is not addictive or problematic, but it is the social features embedded in different forms of the Internet that capture users’ attention and draw them to use it – and even to excessively use it. We investigate the phenomenon in the context of social networking sites as we believe the interactive and social features of these sites have the potential to cause problematic use. In addition, the emergence of social networking sites has dramatically changed the way people communicate, as well as Internet use patterns. In a survey titled “Summer ‘10 Teen Lifestyle Report” conducted in September 2010 with a total of 1,208 respondents of college age, social networking sites were rated the top Web destination for both male and female respondents for the first time, with respondents spending more than 10 hours a week using only Facebook. The report observed, “Teens have caught the Facebook bug: In a word it would be dominance” [YouthTrends, 2011].

Besides the interactive features of SNSs that have a high potential for causing problematic use, researchers have been particularly interested in the relationship between the development of problematic Internet use and psychological well-being [Caplan, 2002, 2007; Kim, LaRose, and Peng, 2009; Kraut et al., 1998].
Psychological well-being has been represented by numerous psychological constructs, including self-esteem, life satisfaction, depression, and loneliness. It is important to speculate which psychological well-being variable may be more salient to the development of problematic use and how this psychological well-being variable leads to the related negative outcomes. Huang [2010] conducted a comprehensive review of studies investigating the relationship between problematic Internet use and psychological well-being variables, and found that this relationship has received considerable attention among researchers. Given the salience of the self-esteem variable in determining different forms and patterns of Internet use, the primary objective of this paper is to investigate how self-esteem, a well-known psychological well-being variable, associates with the development of problematic Internet use in the context of social networking sites.

2. LITERATURE REVIEW

In this section, we provide a comprehensive review of the literature on different perspectives of problematic Internet use in order to develop a thorough picture of its development and evolution.

2.1. Earlier Studies on Problematic Internet Use

The earliest stream of studies on problematic Internet use emphasized assessment, diagnosis, and treatment. Basically, DSM-IV criteria served as the foundation for these studies. Based on the DSM-IV criteria for substance abuse, Goldberg [1995] used the term Internet addiction disorder to define problematic use of the Internet. In each of the four criteria of substance abuse (tolerance, withdrawal, craving, and negative life consequences), Goldberg replaced the word substance with the word Internet. The four criteria were also adopted by other researchers [O'Reilly, 1996; Young, 1997].

Young and Rodgers [1998a, 1998b] later introduced an alternative term, pathological Internet use, and claimed that addiction has extended into the psychiatric lexicon in which problematic Internet use was identified to associate more with significant social, psychological, and occupational impairments. They redefined problematic Internet use as behavioral impulse control failure or disorder, which did not involve an intoxicant and was most akin to pathological gambling.

Most of these early studies of problematic Internet use were built on DSM-IV criteria and emphasized assessment, diagnosis, and treatment. There is a general
lack of theoretical understanding of how problematic use of the Internet develops and how it correlates with other variables.

2.2. Theory-Based Studies of Problematic Internet Use

To address the limitation of earlier studies of problematic Internet use, a number of researchers have begun to investigate the phenomenon with the support of theoretical frameworks. For example, Davis [2001] first proposed the theory-based cognitive-behavioral model of problematic Internet use. The model implies a more important role of cognition-behavior relationship in the development and maintenance of problematic Internet use. Caplan [2002] expanded Davis’s theoretical model and examined the association between problematic Internet use and several psychological well-being variables, including self-esteem, loneliness, depression, and shyness.

2.3. Internet Use and Psychological Well-Being

Several researchers have been particularly interested in studying the relationship among Internet use, psychological well-being, and related outcomes [Caplan, 2003; Kraut et al., 1998; Morahan-Martin and Schumacher, 2003]. These researchers generally hold three different perspectives toward the relationship.

The first perspective suggests that use of the Internet has an overall *positive effect on psychological well-being*. For instance, Morahan-Martin and Schumacher [2003] found that lonely individuals prefer to use the Internet to obtain emotional support. Those people make friends online and experience greater satisfaction online than in the real world. The second perspective argues that Internet use is *detrimental to one’s psychological well-being*. Kraut and colleagues [1998] found that greater use of the Internet is associated with a decline in participants’ communication with their family, a decline in the size of their social circle, and an increase in the degree of depression and loneliness. Researchers holding the third perspective argue that psychological problems, such as low self-esteem, *predispose individuals to the development of problematic Internet use* [Caplan, 2003]. Researchers with this perspective contend that psychologically ill individuals are less competent in interpersonal interaction and are more likely to develop a preference for online social interaction, which, in turn, sets the stage for development of problematic Internet use.
Further, we observed fragmented studies of problematic Internet use. The earliest studies focused on assessment, diagnosis, and treatment, whereas more recent studies tended to emphasize theory-based research, including studies by several researchers particularly interested in the correlation between problematic Internet use and psychological well-being. Through the years, research on problematic use has been extended to the subtypes of Internet-based technologies, including instant messaging, online gaming, and, most recently, social networking sites. The interactive and social features embedded in these Internet activities are believed to have a high potential for causing problematic use.

By incorporating the psychological well-being variable (e.g., self-esteem) into the theory-based model of problematic Internet use, the current study is believed to contribute theoretically by enriching the prior research model of problematic Internet use, by examining the influence of psychological problems, and by focusing on problematic use of emerging social networking technologies.

3. RESEARCH MODEL AND HYPOTHESES

In the current study, we built on Caplan’s [2010] generalized problematic Internet use (GPIU) model and investigated the development of the problematic use of social networking sites and its relationship with self-esteem.

3.1. Key Constructs in the Research Model

We expanded the research model by integrating a psychological well-being variable (self-esteem) into our study (Figure 1). Borrowing the definition of “problematic Internet use” from Beard and Wolf [2001], we defined the problematic use of social networking sites as use that creates social, school, and/or work difficulties in one’s life.

![Figure 1. Hypothesized Model of Problem Internet Use and Self-Esteem](image-url)
3.2. Negative Outcomes

Negative outcomes in the current study refers to the severity of personal, social, and professional/academic problems resulting from one’s problematic use of social networking sites. Davis [2001] suggested that problematic cognitions and behaviors intensify and accumulate over time and continue to result in negative outcomes, such as social withdrawal and missing classes/work.

3.3. Deficient Self-Regulation

Deficient self-regulation refers to a state of inadequacy in monitoring one’s use, judging one’s use behaviors, and adjusting one’s use pattern [Bandura, 1991]. Deficient self-regulation has two dimensions – cognitive preoccupation (i.e., cognitive dimension) and compulsive use (i.e., behavioral dimension) [Caplan, 2010]. Davis [2001] argued, with his cognitive-behavioral theory, that the cognitive and behavioral processes work together to develop negative consequences associated with problematic Internet use. Kubey et al. [2001] also contended that deficient self-regulation might finally result in negative consequences such as difficulties in face-to-face interpersonal relationships. We believe that, when the use of SNSs becomes behaviorally compulsive and cognitively obsessive, there is a higher chance that negative outcomes in different life aspects will occur, such as missing classes, encountering troubles at work, and experiencing a deterioration of relationships with family and friends in the real world. Therefore, we have the following hypothesis:

\[ H1: \text{Deficient self-regulation is positively related to negative outcomes arising from one's use of social networking site.} \]

3.4. Mood Regulation

Mood regulation in the current study refers to the mechanisms of mitigating one’s anxiety about social self-presentation and interpersonal communication. Regulating one’s mood through use of the Internet is one of the salient cognitive symptoms of problematic Internet use, as suggested by prior studies [Caplan, 2002, 2010; LaRose, Lin, and Eastin, 2003]. When Internet use serves as an exclusive mechanism for regulating one’s mood, users incline to use the Internet excessively without their knowledge. In earlier years, Caplan [2002] realized that mood regulation served as an important cognitive predictor of problematic use. Caplan [2010] and LaRose et al. [2003] both emphasized the role of mood
regulation in developing deficient self-regulation. Therefore, we have the following hypothesis:

\[ H2: \text{Using social networking sites for mood regulation is positively related to deficient self-regulation.} \]

3.5. **Preference for Online Social Interaction**

Preference for online social interaction (POSI) is “a cognitive individual-difference construct characterized by beliefs that one is safer, more efficacious, more confident, and more comfortable with online interpersonal interactions and relationships than with traditional face-to-face social activities” [Caplan, 2003, p. 629]. Caplan [2002] found that individuals prefer using the Internet to regulate the negative affective states associated with social communication. Prior studies indicate that individuals who are socially anxious or incompetent show a preference for using online interaction as a platform to palliate the anxiety of self-presentation in face-to-face interactions [Caplan, 2007]. In other words, individuals who are socially incompetent in real life would prefer online social interaction in which they feel more confident and gain more self-presentation control. In addition, they would use the Internet to relieve the discomfort of real life social interaction. Therefore, we have the following hypothesis:

\[ H3: \text{Preference for online social interaction is positively related to mood regulation in one’s use of social networking sites.} \]

Building on the cognitive-behavioral theory [Davis, 2001], a number of researchers have identified the preference for online social interaction as one of the important cognitive symptoms of problematic use [Caplan, 2003, 2005; Kim and Davis, 2009; Kim et al., 2009]. Researchers have found that preference for online social interaction also predicts the degree of compulsive use, which is one of the indicators for deficient self-regulation [Caplan, 2003, 2005; Kim and Davis, 2009; Kim et al., 2009]. The argument advanced here is that a preference for online social interaction would lead to compulsive use of online social platforms. Therefore, individuals who prefer online social interaction rather than face-to-face interaction have a higher tendency to fail in regulating their use of social networking sites, a situation which usually results in problematic use. We thus seek to test the following hypothesis:

\[ H4: \text{Preference for online social interaction is positively related to deficient self-regulation in one’s use of social networking sites.} \]
3.6. Self-Esteem

Self-esteem refers to a person’s overall evaluation or judgment of his or her own self. Baumeister [1997] and Harter [1993] coincidently indicated that a lack of unconditional parental or peer support would create feelings of inadequacy and worthlessness, and in turn lead to the development of low self-esteem. Self-esteem has been studied rigorously in psychology studies to understand its relationship with addiction behavior [Craig, 1995; Hirschman, 1992; Marlatt, Baer, Donovan, and Kivlahan, 1988]. Individuals with low self-esteem incline toward negative self-evaluation, are suspicious of praise, and interpret evaluative information negatively to themselves [Baumeister, 1993; Swann, 1996]. These individuals tend to use addictive substances to withdraw or escape from these negative evaluations and the stress of interpersonal relationships [Craig, 1995].

Building on the cognitive-behavioral model of generalized problematic Internet use [Davis, 2001], researchers treated psychological well-being (e.g., self-esteem) as a distal antecedent to problematic behaviors. Individuals with low self-esteem are usually incompetent in social communication. They prefer online social communication methods in which they feel more relaxed and confident and have more self-presentation control [Caplan, 2003]. We believe that individuals with low self-esteem prefer using social networking sites to withdraw or escape from the negative evaluations and the stress of interpersonal relationships encountered in real life. In prior studies, Davis, Flett, and Besser [2002] found that low self-esteem correlated with the development of problematic Internet use and that it contributed to the overall variance of the construct. Armstrong et al. [2000] also revealed that poor self-esteem predicts problematic Internet use behavior. Low self-esteem is thus served as a hypothesized antecedent to preference for online social interaction and sets the stage for the development of problematic use of social networking sites. Therefore, we have the following hypothesis:

\[ H5: \text{Self-esteem is negatively related to preference for online social interaction in one's use of social networking sites.} \]
4. METHODOLOGY
This section discusses the data collection process and describes the measurement instrument used in the current study.

4.1. Data Collection
We conducted an online survey by administrating questionnaires in an online surveying system, Qualtrics. We posted invitation messages and distributed the URL on one of the most popular online social networking sites, Facebook. We chose Facebook because we believe that all Facebook users have a general understanding of basic information pertaining to social networking sites and their own use behaviors toward it. We offered shopping vouchers worth US$15 as an incentive to encourage more participation. Data for the current study came from online surveys completed voluntarily by 212 general Facebook users. We performed a data cleanup and finally obtained 200 usable observations. The majority of participants (87.5%) are within the age group of 16-25. The proportions of the two genders of participants are roughly equal, with 48% male and 52% female.

4.2. Measures
Our measurement instrument included two broad types of measures (Table 1). We adopted and modified problematic Internet use scales from Caplan [2002, 2010] to measure the potential misuse of social networking sites and its related negative outcomes. Our instruments also included measures of self-esteem [Rosenberg, 1965].

5. DATA ANALYSIS
We performed the data analysis in a holistic manner using partial least squares (PLS). PLS has the ability to model latent constructs under the condition of non-normality and to manipulate small- to medium-sized samples well. PLS is also highly compatible in analyzing highly complex predictive models and provides data for validating and interpreting the measurement model and structural model. The versatile functions of PLS have made it one of the most popular data analysis methods in academic studies [Chin, 2005; Chin and Gopal, 1995; Compeau and Higgins, 1995].
Table 1. Summary of Statistics and Results of Factor Analysis

<table>
<thead>
<tr>
<th>Individual Items and Scales</th>
<th>Mean</th>
<th>S.D.</th>
<th>Factor Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>DSR</td>
</tr>
<tr>
<td><strong>Deficient Self-regulation (CR = 0.91; AVE = 0.63)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I want to, or have made unsuccessful efforts to, cut down or control my use of Facebook</td>
<td>3.71</td>
<td>1.73</td>
<td>0.80</td>
</tr>
<tr>
<td>I have attempted to spend less time on Facebook but have not been able to</td>
<td>3.64</td>
<td>1.77</td>
<td>0.83</td>
</tr>
<tr>
<td>I have tried to stop using Facebook for long periods of time.</td>
<td>3.65</td>
<td>1.63</td>
<td>0.61</td>
</tr>
<tr>
<td>I am preoccupied with Facebook if I cannot log on for some time</td>
<td>3.14</td>
<td>1.77</td>
<td>0.85</td>
</tr>
<tr>
<td>When not on Facebook, I wonder what is happening there</td>
<td>3.68</td>
<td>1.83</td>
<td>0.77</td>
</tr>
<tr>
<td>I feel lost of can’t go Facebook</td>
<td>2.85</td>
<td>1.66</td>
<td>0.87</td>
</tr>
<tr>
<td><strong>Mood Regulation (CR = 0.91; AVE = 0.78)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have used Facebook to talk with others when I was feeling isolated</td>
<td>3.85</td>
<td>1.52</td>
<td>0.45</td>
</tr>
<tr>
<td>I use Facebook to make myself feel better when I’m down</td>
<td>3.84</td>
<td>1.63</td>
<td>0.48</td>
</tr>
<tr>
<td>I have gone Facebook to make myself feel better when I was down or anxious</td>
<td>3.73</td>
<td>1.55</td>
<td>0.44</td>
</tr>
<tr>
<td><strong>Negative Outcomes (CR = 0.91; AVE = 0.78)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have gotten into trouble with my employer or school because of visiting Facebook</td>
<td>3.13</td>
<td>1.77</td>
<td>0.62</td>
</tr>
<tr>
<td>I have missed classes or work because of visiting Facebook</td>
<td>2.91</td>
<td>1.76</td>
<td>0.69</td>
</tr>
<tr>
<td>I have missed social engagements because of visiting Facebook</td>
<td>2.61</td>
<td>1.73</td>
<td>0.73</td>
</tr>
<tr>
<td><strong>Preference for online social interaction (CR = 0.93; AVE = 0.83)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am treated better on Facebook relationships than in my face-to-face relationships</td>
<td>3.47</td>
<td>1.62</td>
<td>0.51</td>
</tr>
<tr>
<td>I am more confident socializing on Facebook than I am offline</td>
<td>3.41</td>
<td>1.71</td>
<td>0.49</td>
</tr>
<tr>
<td>I am more comfortable with Facebook than people</td>
<td>3.74</td>
<td>1.65</td>
<td>0.45</td>
</tr>
<tr>
<td><strong>Self-esteem (CR = 0.81; AVE = 0.56)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On the whole, I am satisfied with myself</td>
<td>3.28</td>
<td>1.30</td>
<td>-0.38</td>
</tr>
<tr>
<td>At times, I think I am no good at all</td>
<td>3.76</td>
<td>1.60</td>
<td>-0.28</td>
</tr>
<tr>
<td>I feel that I have number of good qualities</td>
<td>3.65</td>
<td>1.26</td>
<td>-0.29</td>
</tr>
<tr>
<td>I am able to do things as well as most other people</td>
<td>3.21</td>
<td>1.43</td>
<td>-0.42</td>
</tr>
<tr>
<td>I feel I do not have much to be proud of</td>
<td>3.63</td>
<td>1.45</td>
<td>-0.36</td>
</tr>
<tr>
<td>I certainly feel useless at times</td>
<td>3.20</td>
<td>1.54</td>
<td>-0.47</td>
</tr>
<tr>
<td>I feel that I’m a person of worth, at least on an equal plane with others</td>
<td>3.04</td>
<td>1.46</td>
<td>-0.34</td>
</tr>
<tr>
<td>I wish I could have more respect for myself</td>
<td>4.71</td>
<td>1.23</td>
<td>-0.19</td>
</tr>
<tr>
<td>All in all, I am inclined to feel that I am a failure</td>
<td>3.22</td>
<td>1.60</td>
<td>-0.27</td>
</tr>
<tr>
<td>I take a positive attitude toward myself</td>
<td>3.17</td>
<td>1.52</td>
<td>-0.35</td>
</tr>
</tbody>
</table>
5.1. Measurement Model

Convergent validity indicates the degree to which the items of a scale that are theoretically related are also related in reality. It is examined by the use of composite reliability (CR) and average variance extracted (AVE). The critical values for CR and AVE are at least 0.70 and 0.50, respectively (Fornell and Larcker, 1981). As shown in Table 1, all CR and AVE values fulfill the recommended levels, with CR ranging from 0.81 to 0.93 and the AVE ranging from 0.56 to 0.83. For the item loadings, all of the items from generalized problematic Internet use scales meet the recommended level, which is higher than 0.70. Two item loadings from the self-esteem construct fall behind 0.70, and are dropped from subsequent analysis.

Discriminant validity is the degree to which the measurement is not a reflection of some other variables. It is indicated by low correlations between the measure of interest and the measure of other constructs (Fornell and Larcker, 1981). Evidence of discriminant validity can be demonstrated when the squared root of the average variance extracted (AVE) for each construct is higher than the correlations between it and all other constructs. As shown in Table 2, 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.

<table>
<thead>
<tr>
<th>Construct</th>
<th>DSR</th>
<th>MR</th>
<th>NO</th>
<th>POSI</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deficient Self-Regulation</td>
<td>0.79</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mood Regulation</td>
<td>0.51</td>
<td>0.88</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Outcomes</td>
<td>0.76</td>
<td>0.48</td>
<td>0.88</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preference for Online Social Interaction</td>
<td>0.52</td>
<td>0.58</td>
<td>0.56</td>
<td>0.91</td>
<td></td>
</tr>
<tr>
<td>Self-Esteem</td>
<td>-0.45</td>
<td>-0.27</td>
<td>-0.53</td>
<td>-0.43</td>
<td>0.74</td>
</tr>
</tbody>
</table>

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

5.2. 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.
Figure 2. Standardized Estimates for Structural Model

The results indicate that the exogenous variables explain 59% of variance in negative outcomes, 34% of variance in deficient self-regulation, 34% of variance in mood regulation, and 19% of variance in preference for online social interaction. All of the structural paths were found to be statistically significant in the research model, and all hypotheses were supported. Deficient self-regulation was found to be statistically significant to the negative outcomes of one’s problematic use of Facebook, with a path coefficient at 0.76 (p<0.001). Preference for online social interaction and mood regulation were found to have significant effects on deficient self-regulation, with path coefficients at 0.34 (p<0.001) and 0.31 (p<0.001), respectively. The preference for online social interaction was found to have a strong impact on mood regulation, with a path coefficient at 0.58 (p<0.001). Self-esteem also showed significant negative impact on preference for online social interaction, with a path coefficient at -0.43 (p<0.001).

6. DISCUSSION AND CONCLUSION

This section summarizes our findings and discusses implications for research and practice, limitations of the study, and directions for future research.

6.1. Findings

Given the growing concern about problematic Internet use, the current study introduced and tested a generalized problematic Internet use model in the context of social networking sites, with the integration of a well-known psychological well-being variable (self-esteem). Our findings supported the hypothesized model that individuals who are low in self-esteem prefer online social interaction more than traditional face-to-face communication. Moreover, a preference for
online social interaction, as well as use of social networking sites for mood regulation, leads to deficient self-regulation, which, in turn, results in negative outcomes.

6.2. Implications for Research and Practice

Social networking sites are recognized as one of the most popular platforms for online social interaction. This study makes significant contributions to both conceptual and empirical research on the problematic use of social networking sites. In particular, it demonstrates the association between problematic use and psychological well-being. For these reasons, implications of the current study should receive attention from both researchers and practitioners.

This research contributes greatly to existing research on problematic use of social networking sites in several ways. First, the empirical study depicts the important antecedents for development of problematic use of social networking sites and its resulting consequences. The study adds to the limited research that has been done regarding problematic use of social networking sites and thus provides a broader basis for future studies. In addition, our empirical research helps validate the instruments for investigating the problematic use of social networking sites. Finally, the current study integrates self-esteem into the generalized problematic Internet use model and reveals the relationship between the problematic use of social networking sites and psychological well-being. Our study was among the first to take the initial step toward developing and testing a theoretical model for problematic use of social networking sites and its relation to psychological well-being.

The current study includes behavioral-cognitive and psychological well-being variables in the model, which can be used by practitioners and educators to evaluate the degree to which individuals and students are developing problematic use of social networking sites, and how they are doing this. We believe that the results provide substantial insights and guidelines for practitioners and educators, as well as social networking platform administrators, with regard to creating a sustainable and healthy environment for use of social networking sites. When they notice behavioral and/or cognitive symptoms of problematic use of Facebook, they may take one or more of the following steps to address the issue: (1) organizing real-world social activities, (2) delivering workshops to build self-esteem and confidence, (3) providing counseling services to individuals with emotional needs, (4) setting a time limit for each social networking visit, and (5)
installing pop-up reminders to alert users about the time spent on the sites over a certain length of time.

6.3. Limitations

The study of computer-mediated communication, especially in the context of social networking sites, is new. Our study thus represents an initial step toward developing and testing a theoretical model that can specifically apply to modern forms of online social interaction. The model tested here is to support the most basic aspects of the adopted theory. Thus, limitations of the current study are worth addressing in order to recommend directions for future research.

First, the current study relied heavily on self-report data in validating measures, and did not obtain or include any objective measures, such as direct observation and non-self-report data, owing to difficulties in data collection. Typically, objective measures on use behaviors pertaining to social networking sites and the outcomes of such behavior would greatly enhance the validity and reliability of the measures.

Second, the current study used a cross-sectional rather than longitudinal design; it was inadequate to determine causality with the current data. The structural equation modeling technique was, however, an advanced analysis tool enabling researchers to determine whether data supported our hypothesized causal relationships. In our study, the structural equation modeling results offered substantial support and confidence to our hypothesized model.

6.4. Directions for Future Research

Problematic Internet use has been extensively studied, but much more work remains to be done. Studies are needed, for example, to further assess the validity and reliability of the advanced problematic Internet use model. For instance, researchers could conduct a test-retest to assess the reliability of the measurements.

Although the hypothesized model in the current study accounted for 34% of variance in deficient self-regulation and 59% of variance in negative outcomes, there is still more variance to be accounted for. Future studies should consider including additional measures and finding ways to strengthen the model, so as to increase the proportion of explainable variance. Moreover, future studies could use a longitudinal or experimental design to determine the causal relations among the variables.
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