

Predicting Students' Internet Addiction Based on the Behavioral Activation / Inhibition Systems and Social Anxiety

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Abstract

Introduction: The purpose of this research was to investigate the role of behavioral activation/inhibition systems and social anxiety in the prediction of students' Internet addiction.

Methods: This study used a descriptive-correlative design. For this purpose, 356 students were selected through random cluster sampling from Arak University (172 males and 184 females). They were asked to answer the Behavioral Inhibition/Activation Systems Scale, Internet Addiction Test and Social phobia Inventory. Then, the correlation and regression analyses were employed.

Results: The results indicated that social anxiety is significantly and positively correlated with Internet addiction, there was no significant relationship between Internet addiction and behavioral activation systems, and behavioral inhibition systems were significantly and positively correlated with Internet addiction. Regression analysis showed that social anxiety and behavioral inhibition systems could predict Internet addiction.

Conclusion: Based on the present study results, it can be concluded that social anxiety and behavioral inhibition system predicted higher levels of Internet addiction.

Keywords: Internet Addiction, Behavioral Inhibition System, Behavioral Activation System, Student

Introduction

In the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders, Internet addiction is taken into account as a new mental disorder [1]. Internet addiction is a behavioral addiction which is defined as the person's disability to have control over the Internet usage [2] and encompasses the increased tolerance, withdrawal syndrome, emotional distresses and disconnection of social relations [3]. Studies show that Internet addiction has become an epidemic in the new era and its prevalence is reported in 1%-36.7% [1].

One of the theoretical perspectives which can explain the vulnerability against the creation and continuity of Internet addiction is the Reinforcement Sensitivity Theory (RST) of neuropsychological personality [4]. Reinforcement Sensitivity Theory (1993) introduces fundamental and independent biological dimensions for motivation and personality [5]. One dimension is the behavioral activation system which reacts to the reward stimulus with a positive response and tendency behavior. Behavioral activation system includes power exploitation and fast follow-up of objective (drive), acceptance over the reward (reward responsiveness) and tendency to new and reward-giving experiences (fun seeking) [6]. Another dimension is the behavioral inhibition which reacts to the punishment or reward cancellation by fear or anxiety and avoidance behavior and withdrawal.

The main findings of previous studies on reinforcement sensitivity theory and addiction

have proposed that high levels of behavioral activation system sensitivity puts the person into a vulnerable situations leading to tendency and compulsory behaviors such as alcohol and drug abuse [7]. In a study by Handet, Kimbrel, Michel, Nelson-Gary [8], the high behavioral activation system predicts alcohol and drug abuse [9]. In contrast, weak behavioral inhibition system only predicts drug abuse. Furthermore, findings show that pathological gambling behaviors, as related to the high score of behavioral activation system, is connected to the low scores of behavioral inhibition system, too [10].

Compared to other addictive behaviors, previous studies on Internet addiction emphasizes the role of the behavioral inhibition system rather than the behavioral activation system. A comparative study on Internet addiction and alcohol abuse show that Internet addiction is related to alcohol abuse among students [11]. However, students with Internet addiction achieved higher scores in behavioral inhibition system and subscales of fun seeking of behavioral activation system. This is while the students with alcohol abuse obtained higher scores in subscales of fun seeking and behavioral activation system and lower scores in behavioral inhibition system.

Similarly, Meerkerk et al., [12] suggested that Internet addiction is most likely related to the behavioral inhibition system rather than the behavioral activation system. Another research concludes that the problems with Internet usage among the adolescents are created in response to the high behavioral inhibition system [13]. However, Yen et al. [14] reported contradictory results indicating that the behavioral activation system and fun seeking are dangerous factors for Internet addiction.

These contradictory results can highlight the main properties of Internet addiction in connection to the role of "anxiety" which distinguishes it from other kinds of addiction [15]. Studies indicate high suffering levels of people with Internet addiction to anxiety disorders and symptoms related to anxiety including social anxiety [16, 17].

Nonclinical social anxiety includes social anxiety, excessive discomfort, negative rumination and physical symptoms like vibration, itching and sweating before and after social interactions. In fact, social anxiety is related to the weak social skills and failure in daily social interactions. For these people, online communication is an appropriate replacement for an unsatisfactory social life which may lead to spending a lot of time in the Internet which in turn has created problems in daily life. This issue actually takes away the opportunity for learning social skills in real relationships with others [18].

In a study which lasted for two years, Ku et al. [19] noticed that social anxiety can predict Internet addiction. In their study, Milani et al. [20] reported that 15% of those suffering from Internet addiction show the symptoms of social anxiety. In a study conducted in Taiwan by Yen et al. [21], it was concluded that there is a significant relationship between Internet addiction and social anxiety. In this regard, Weidman et al. [22] argued that there is a real positive relationship between social anxiety and using the Internet for achieving the social objectives.

People suffering from social anxiety experience more comfort and self-expression in online social activities.

In sum, the behavioral activation system and behavioral inhibition system are sometimes taken into account as the groundwork for anxiety and impulsivity, respectively [23]. Since Internet addiction is connected to anxiety and impulsivity [12], hence, it can be considered that anxiety can diagnose how behavioral activation system and behavioral inhibition system affect Internet addiction. In regards to the above mentioned issues, this study intends to investigate the role of behavioral activation/behavioral inhibition systems and social anxiety in predicting students' Internet addiction.

Methods

This study is descriptive – correlation research. The population included all the students of the Arak University from among whom, 370 students were selected by stratified cluster sampling method and tested by scale of behavioral inhibition/activation system, Internet addiction test and social phobia inventory. To encourage the students and increase the accuracy coefficient and the accuracy of responses to the research questions, they were told that they can be kept informed of the test results, if willing. To control the effect of order and fatigue, scales were presented with different orders upon the proportion. Data related to 14 subjects were excluded due to incomplete questionnaires and 356 questionnaires were analyzed.

Behavioral Inhibition/Activation Systems Scale: This scale was developed by Carver and White [24] which is a self-reporting scale for evaluating the dispositional sensitivity under the behavioral activation and behavioral inhibition systems. This scale is composed of 24 questions in which the BIS subscale includes 7 items and refers to the reactions occurred in lieu of punishment prediction. BAS scale includes 13 items which measure the behavioral activator system sensitivity. In this questionnaire, BAS includes three subscales: drive, reward responsiveness and fun seeking. Also, 4 items include the deviant questions and are included in the scale as the covering items and play no role in assessing the BIS/BAS. As reported by Carver and White, the internal stability of the BIS and BAS subscales are 0.74 and 0.71, respectively. Psychometric properties of the Persian version of this scale in Iran was reported desirable among the Shiraz students by Mohammadi. Abdollahi Majarshin has also reported the validity in the retest method for the BAS and BIS scales, 0.78 and 0.81, respectively [25].

Internet Addiction Test: This test was developed by Young and is composed of 20 items which is designed based on the criteria of the revised version of the fourth Diagnostic and Statistical Manual of Mental Disorders for pathological gambling behaviors diagnosis. Scoring is made based on a Likert scale from 0 to 5 and the obtained scores classify each person into one group: normal user group (scores 20-39), user with mild addiction (scores 40-69) and user with severe addiction (scores 70-100) where excessive use has made him dependent and he needs treatment. Yong (1998) reported the test internal validity

beyond 0.92 and emphasized that this test has the clinical diagnosis capability among the people addicted to the Internet [26]. Vidyanto and McMuran [26] found a high face validity for this test. In Iran, Alavi et al. [27] obtained the test validity by retest and split-half methods as 0.82 and 0.72, respectively and focused on its content validity. These scholars have reported that this test has desired psychometric properties and it can be used for screening and clinical diagnosis of people with Internet addiction.

Social phobia Inventory. This scale is a 17-item self-reporting tool which is composed of three subscales of fear, avoidance and physiological discomfort developed by Connor et al. [28]. Social phobia inventory is rated on a 5-degree Likert scale (not at all – very much). Retest coefficient is reported within 0.78 – 0.89, internal consistency (Cronbach's alpha) within 0.82 – 0.94 and cutting score 19. In Iran, Cronbach's alpha of this inventory was reposted within 0.74 – 0.89, retest coefficient, 0.68, and convergent validity of its subscales within 0.64 – 0.78 [29].

Results

A preliminary analysis of the data was conducted to ensure the compliance of the assumptions for the

regression analysis (inter-correlation among variables). Table 1 provides an overview of the average, the standard deviation and the inter-correlation of all the variables in this study.

The results of the Pearson correlation test revealed (table 1) a significant positive correlation between social anxiety, behavioral inhibition system with Internet addiction ($P < 0.01$). This means that individuals with higher Internet addiction scores had higher levels of social anxiety and behavioral inhibition system. In addition, there is no significant correlation between Internet addiction and the behavioral activation system.

The results of the multiple regression analysis are presented in Table 2.

A stepwise multiple regression was conducted to test if behavioral systems and social anxiety significantly predicted the participants' Internet addiction. The results indicated that social anxiety and the behavioral inhibition system enter the equation respectively, and they explained 17% of the variance ($R^2 = 0.17$, $F = 35.05$, $p < 0.01$). It was found that social anxiety significantly predicted Internet addiction ($\beta = 0.38$, $p < 0.01$), as it also predicted the behavioral inhibition system ($\beta = 0.14$, $p < 0.01$).

Table 1. Mean, standard deviation and inter-correlation of variables

Variables	M	SD	Internet addiction
Social Anxiety	18/05	10/95	0/38**
Behavioral Inhibition System	20/81	3/36	0/19**
Behavioral Activation System	30/34	5/25	0/05

**p<0/01 *p<0/05

Table 2. Multiple regression analysis (stepwise method), predicting Internet addiction through social anxiety and behavioral systems variables

Regression progress steps	Variables	coefficientB	coefficientβ	coefficientt	AdjustedR square	coefficient F
First step	Social Anxiety	0/48	0/38	7/77**	0/15	60/47**
Second step	Behavioral Inhibition System	0/58	0/14	2/90**	0/17	35/05**

**p<0.01

Discussion

The present study aims at investigate the role of behavioral brain systems and social anxiety in predicting the students' Internet addiction. Findings showed that social anxiety has a positively significant correlation with Internet addiction and is a significant predictor for Internet addiction. These findings are consistent with the studies by Ku et al. [19], Milani et al. [20], Yen et al. [21] and Weidman et al. [22].

Actually, social anxiety is related to lack of self-confidence in self-expression skills to create a positive feeling in others. One way to reduce these kind of anxieties is online interactions, because it is less risky than face-to-face communications and in which hiding oneself and having control over the negative aspects related to the appearance and behavior are seen more. This is while face-to-face interactions among people with social anxiety comes along with fear of being seen by others. Online interactions facilitates connections by keeping people anonymous. Satisfactory interpersonal Internet

communications prevents people for establishing interpersonal s in the real world. As a result, people get motivated to use more Internet and keep themselves away from the real world and real interpersonal connections. Secluding people from healthy social activities and more loneliness are among the expected negative consequences of Internet addiction. Hence, it seems that Internet addiction and social anxiety are mutually communicated, because those who suffer from social anxiety increase referring to the Internet due to easier usage and on the other hand, excessive use of the Internet can aggravate the social isolation among those who are currently suffering from it.

Extreme users of Internet are mostly neuroticism and less extrovert, socially anxious and emotionally alone and obtain more support from Internet social media. In fact, extreme dependence to the virtual world is connected to the person's separation from the reality world and as a result decreases his happiness and social interactions. Accordingly, the user's mind gets involved with inefficient

imaginings resulting in depression, anxiety and social isolation.

Findings also indicated that the behavioral inhibition system has a positive and significant correlation to Internet addiction and has no connection to the behavioral activation system. The regression analysis showed that the behavioral inhibition system is a significant predictor for Internet addiction. These findings are also consistent with the studies by Yen et al. [11], Mirker et al. [12] and Gills and Prash [13] and inconsistent with the study by Yen et al. [14].

The obtained results can be explained based on the reinforcement sensitivity theory (RST) [4]. Behavioral inhibition system is the basis of anxiety and its generation is connected to two sets of behavioral inhibition mechanisms where the nervous pathways of the Septo-Hippocampal System (SHS) and amygdala play a role in these processes. In accordance with the results of this study, people with Internet addiction tend to have a more active behavioral inhibition system. This finding explains the high comorbidity of social anxiety disorder and Internet addiction. High activity of behavioral inhibition system among people who are socially anxious and emotionally alone drives them towards the Internet dependence. In other words, the behavioral inhibition system positively affects the appearance and continuity of social anxiety symptoms. This is due to the fact that those who scored higher in the inhibition system are experiencing higher levels of anxiety. In order to cope with anxiety, these people turn to the online interactions as an avoidance strategy.

In connection to the inconsistency of this research's results and the findings of a study by Yen et al [14], the population of this study can be taken into account. Yen et al. introduced the high level of behavioral inhibition system, especially the fun seeking, as the predictors of Internet addiction where based on the studied age group, i.e. adolescence, this inconsistent can be explained. Compared to other age groups, adolescents are more reckless, more risky and more excited. Actually, as a challenging period of human life, adolescence can pave the way for risky behaviors. In fact, high levels of behavioral activation among the adolescents facilitates properties like impulsivity, adventurous, hedonistic, novelty seeking and variety seeking and this can differentiate the predictors of Internet addiction in this age group.

Conclusion

In sum, this study showed that the behavioral inhibition system and also social anxiety play important roles in Internet addiction and the components of personality predictor of Internet addiction are different from other addictive behaviors. This recent conclusion can be a warning to those who are responsible for public health so that they have to pay special attention to the nature of this type of addiction in line with the

prevention of Internet addiction and its treatments.

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