

Research Paper: Predicting Internet Addiction Based on Sensation Seeking: Mediation Effect of Attachment Styles



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ABSTRACT

Objective: Psychologists have warned about the disadvantages of overusing Internet and a new kind of addiction named Internet addiction. The present study intended to review the role of both sensation seeking (directly and indirectly, by mediation of attachment styles) and attachment styles (directly) in Internet addiction.

Methods: The present research was a cross-sectional study. Statistical population of the research was all the students studying Bachelor's Degree course at the Faculty of Psychology and Educational Sciences of Allameh Tabataba'ei University. Of the total 420 individuals, 180 persons (35 men and 145 women) were selected as members through convenience sampling method. Zuckerman's Sensation Seeking, Collins and Read's Attachment Styles and Young's Internet Addiction" questionnaires were applied to collect data, which were analyzed through structural equation modeling using AMOS and SPSS 16.

Results: Findings demonstrated that the proposed model had adequate goodness-of-fit indices (CMIN/DF: 1.67, GFI: 0.991, RMR: 0.001, CFI: 0.961 & RMSEA: 0.031). Sensation seeking and attachment styles variables were directly related to Internet addiction. Meanwhile, sensation seeking predicted internet addiction indirectly.

Conclusion: Considering the obtained results, sensation seeking, directly and indirectly, by mediation of attachment styles is related to Internet addiction and can predict it. Attachment styles variable also predicts Internet addiction directly.

1. Introduction

Internet is regarded as one of the most important means of communication in the new era and has become a part of reality of our life. It can be said that Internet is an effective tool worldwide because it has changed the world into a global village (Stefanescu, Chele, Chirita, Chirita, & Iinca, 2007). Every day, the number of people using the Internet is rising. By December 2002,

there were 665 million Internet users across the world (Alavi, Merathi, Jannati-fard, & Eslami, 2011). The results of studies showed that young people and teenagers use Internet more than other age groups of people (Bullen & Harre, 2000).

Despite the extensive advantages of using the Internet, psychologists have warned about the disadvantages of overusing the technology that has resulted in a new kind of addiction named 'Internet addiction' or virtual addic-

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tion. [Widyanto and Griffiths \(2006\)](#) have presented the most famous definition of this variable: Internet addiction is a behavioral or non-chemical addiction that includes human-machine interactions. In other words, this disorder brings about physiological, social, educational or professional problems in individuals' lives on extensively using the Internet ([Caplan, 2007](#)). The main characteristics of Internet addiction are mental occupation, uncontrolled willingness and unusual behaviors that lead to distress or disorder ([Rosenberg & Feder, 2014](#)).

Although the prevalence of Internet addiction is reported to be 1-36.7% in both Western and Eastern cultures ([Ko, Yen, Yen, Chen, & Chen, 2012](#)) and ranges between 7.9-8.22% among teenagers ([Tsitsika et al., 2014](#)), data from these studies reported changeable rate of Internet addiction ([Wu et al., 2016](#)). According to [Moayedfar et al., \(2007\)](#) and [Dargahi and Razavi \(2006\)](#), about 30% of Iranian Internet users have Internet addiction. [Rosenberg and Feder \(2014\)](#) found out that there are numerous items casting problematic use of Internet, including personal factors, social anxieties and family issues.

[Manteghi \(2010\)](#) figured out that there is a relationship between emotional gaps in family atmosphere and tendency to visit chat rooms. [Lam \(2015\)](#) also realized that there is a meaningful relationship between mental health of parents and Internet addiction among children. Hence, it can be concluded that Internet addiction should be focused as a new problem among teenagers and youths. Factors playing important roles in the formation and expansion of Internet addiction should be identified, and appropriate use of Internet should be taught to young people to prevent addiction to Internet.

One of the crucial factors of Internet addiction is attachment styles ([Mikulincer & Shaver, 2003](#); [Collins & Feeney, 2004](#)). Attachment is a deep emotional relationship that we have with certain people in our life; this feeling makes us enjoy interaction with them ([Berk, 2004](#)). This pattern of attachment remains relatively stable during the life and transfers from mother to family members and finally expands to groups and turns to be an important factor in shaping the personality of a person ([Bowlby, 1969](#)). Attachment pattern comes in three styles of secure attachment, insecure avoidant attachment and insecure ambivalent/resistant attachment ([Mikulincer & Florin, 2007](#)).

A number of researchers have studied the relationship between Internet addiction and attachment styles. [Lin et al., \(2011\)](#) in their study showed that there is a negative relationship between Internet addiction and secured attachment style. Results of a study by [Şenormancı et al.,](#)

(2014) revealed that those suffering from Internet addiction show more anxious attachment and clear disorder in family performance. Therefore, the assessment of attachment styles and family performance can play a significant role in the treatment of people with Internet addiction.

Another variable that affects Internet addiction is sensation seeking. Sensation seeking is a characteristic defined as a need for different, complex and severe sensations and experiences as well as willingness to take risks. This characteristic can be categorized into four special aspects of thrill and adventure-seeking, experience seeking, disinhibition, and boredom susceptibility ([Zuckerman, 1994](#)). [Velezmore et al., \(2010\)](#) have demonstrated that the subscale of disinhibition predicts misuse of Internet for sexual purposes. According to [Ko et al., \(2006\)](#), web browsing, which is an adventurous mechanism across the world, can be related to sensation seeking. Since sensation-seeking people look for various experiences, the Internet makes it possible for them to get access to a new and diverse phenomenon.

Although a majority of researchers believe that sensation seeking is almost a hereditary trait, they have also accepted the impact of situational or environmental factors on this variable ([Zuckerman, 1994](#)). One of the most important situational factors contributing to sensation seeking is attachment styles. According to prosocial-security hypothesis ([Van Lange, Otten, De Bruin, & Joireman, 1997](#)), secure attachment with parents could protect individuals from problem behaviors (such as Internet addiction), supposedly by (a) promoting individuals' adoption of conservative values ([Brook, Whiteman, & Finch, 1993](#)) and (b) reducing their sensation seeking need ([Barnea, Teichman, & Rahav, 1992](#)).

The prosocial-security hypothesis has received empirical support for late adolescence and undergraduates: in these studies, attachment security was meaningfully associated with more prosocial values and less sensation seeking ([Van Lange, Otten, De Bruin, & Joireman, 1997](#)). [Sarracino et al., \(2011\)](#) also found that sensation seeking has a negative relationship with attachment security to mothers and fathers, particularly in girls.

To address the above-mentioned issues, the current study investigates the relationships among three variables, i.e., sensation seeking, attachment styles, and Internet addiction. Although the variables have been examined in previous related researches including those by [Lin et al., \(2011\)](#) and [Ko et al., \(2006\)](#) and that sensation seeking and attachment styles have individual relationship with Internet addiction, the relationship among these

three variables with each other and in a conceptual model has not been studied yet. It is not obvious whether sensation seeking predicts Internet addiction directly, indirectly (by mediation of attachment styles) or both in a model.

If Internet addiction is directly predicted by sensation seeking, it will be important to regulate the level of sensation seeking as a significant factor in controlling or reducing Internet addiction. Additionally, if the relation between these two variables is indirect and it is mediated through attachment styles, Internet addiction can be controlled via modifying the style of attachment and the degree of sensation seeking simultaneously.

Thus, the study aims to review the role of both sensation seeking (directly and indirectly, by mediation of attachment styles) and attachment styles (directly) in Internet addiction. Based on prior works in the field, these three hypotheses could be drawn: Hypothesis 1: sensation seeking predicts Internet addiction directly; Hypothesis 2: sensation seeking predicts Internet addiction indirectly by mediation of attachment styles; and Hypothesis 3: attachment styles predict Internet addiction directly.

2. Methods

The current research is a cross-sectional study. The statistical population includes all BA students who studied at the Faculty of Psychology and Educational Sciences of Allameh Tabataba'i University in Tehran. There were approximately 420 individuals in the 2015-2016 educational year, and of them, only 180 individuals (35 men and 145 women) were selected through convenience sampling method. One of the best methods for determining the volume of statistical sample in studies that use structural equation modeling is making reference to a common amount. If the number of sample group is less than 100, it would be categorized as small sample.

In comparison, the sample groups encompassing 100 to 200 numbers are considered as average or normal one, and those which include more than 200 are large samples. Generally, small samples are adequate for very simple models; average or normal samples are used for uncomplicated models, and large samples are appropriate for a majority of models. It is also offered that the number of sample's members would be at least two or three times more than the number of latent variables of the model (Alavi, 2013). These 180 participants were chosen according to their age (18-28 years old) and educational stage (BA students).

This research did not encompass MA or PhD students and BA students of other faculties of Allameh Tabataba'i

University. Three required questionnaires were administered among all 180 participants during two months, and the participants were asked to answer them single-handedly. In addition to the needed guideline that was described in the questionnaires' instructions, it was mentioned that participants should abstain from writing their names. Participants' consent was gained, and it was explained to them that their private information would be kept confidential. After investigating research literature and all kinds of examinations, the following questionnaires were used for providing information on variables.

Zuckerman's Sensation Seeking Questionnaire: Zuckerman designed a 40-items questionnaire named Sensation Seeking Standard Scale in 1978 that encompassed four elements, namely, adventure-seeking, experience-seeking, inhibition, and boredom susceptibility. Each question of the questionnaire includes two parts of A and B. Test takers were required to choose each part A or B after reading each section. The highest score is 40, and the lowest one is 0. Scores above 20 show a high degree of sensation seeking. Validity coefficient of this questionnaire is 0.88, and its reliability totaled 0.85 in Zuckerman's study (Zuckerman, 1979; Zuckerman, 1994). The Cronbach's alpha scale for the present study equaled 0.76.

Collins & Read's Attachment Styles Questionnaire: This questionnaire includes 18 items that are measured through markings on a Likert scale. The three subscales of dependence, closeness, and anxiety are understood through factor analysis method that measures avoidant, secure and anxious-ambivalent attachment styles. Collins and Read (1990) showed that the subscales of dependence, closeness and anxiety stayed stable in the time-frame of two months and even 8 months. They reported the Cronbach's alpha for the scale to be higher than 0.80. In this research, Cronbach's alpha and reliability of the questionnaire were determined as 0.84.

Young's Internet Addiction Standardized Questionnaire: The questionnaire includes 21 items (questions) and obtains 5 elements of significance, overuse of Internet, using Internet for calmness, abuse of chat rooms, and ignoring personal and educational obligations. The score of each individual ranges from 0 to 84. If the sum of scores for one individual goes above 44, it indicates Internet addiction. Internal validity of this test is higher than 0.92, and its reliability is reported to be higher than 0.7 (Widyanto & Murran, 2004). Cronbach's alpha was 0.79 for this study.

All data were put into SPSS 16 and AMOS software. Next, statistical methods were used to analyze the data.

1. Descriptive statistics were used in order to calculate mean and standard deviation; and 2. Structural equation modeling was used to determine the relationships among three variables of the study.

3. Results

Table 1 illustrates the mean and standard deviation of each variable including sensation seeking, attachment styles and Internet addiction while Table 2 shows the correlations of variables. The structural equation modeling method was used because it can not only measure a series of latent variables with groups of observed variables but also analyze the structural ties among latent variables. Statistical assumptions of the proposed model of this study are considered appropriately. Table 3 shows the normality test of data. The given Kolmogorov-Smirnov test of Table 2 reports the normality of the investigated variables in the level of significance of 0.05 ($P > 0.05$).

Additionally, according to multicollinearity test, there is an adequate relationship between sensation seeking and Internet addiction and also between attachment styles and Internet addiction because the tolerance coefficient is lower than 1 (0.45, near 0) and the VIF is not higher than 10 and lower than 1 (1.137) in this study.

Linearity test also showed that there is a linear relation between predictor variables and criterion variable (Pearson Correlation Coefficient between Internet addiction and sensation seeking: 0.69, Level of Significance: 0.02 ($P < 0.05$) and Pearson Correlation Coefficient between Internet addiction and attachment styles: 0.72, Level of Significance: 0.01 ($P < 0.05$)).

In this model, all sensation seeking, attachment styles and Internet addiction variables were latent constructs. Sensation seeking included four observed variables or markers (boredom susceptibility, inhibition, adventure-seeking and experience seeking), whereas the attachment styles involved three observed variables or markers (secure, avoidant, anxious-ambivalent). Internet addiction included five markers (significance, overusing Internet, use of Internet for calmness, misuse of chat room and disregarding professional and educational obligations). The results demonstrated that all observed variables related to latent variables in the model have acceptable path coefficients. Hence, the coefficients totaled 0.60 to

Table 1. Descriptive measures for mean and standard deviation of participants in elements of sensation seeking, attachment styles and internet addiction

Variables Measures	Sensation Seeking	Attachment Styles	Internet Addiction
Mean	1.56	3.57	3.61
Standard deviation	1.76	1.81	2.57

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Table 2. Pearson correlation coefficient

		Sensation Seeking	Attachment Styles	Internet Addiction
Sensation seeking	Pearson correlation	1		
Attachment styles	Pearson correlation	0.53 P=0.029	1	
Internet addiction	Pearson correlation Level of significance	0.69 P=0.022	0.71 P=0.014	1

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Table 3. Normality test of data

	Sensation Seeking	Attachment Styles	Internet Addiction
Kolmogorov Smirnov	1.016	1.223	1.178
Level of significance	0.87	0.88	0.88

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Table 4. Obtained amounts of each goodness of fit indicators of the proposed pattern

Indicators of Goodness of Fit	RMSEA	CFI	RMR	GFI	CMIN/df
Obtained amounts	0.031	0.961	0.001	0.991	1.67

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Table 5. Acceptable level of goodness of fit

Indicators of Goodness of Fit	RMSEA	CFI	RMR	GFI	CMIN/df
Acceptable level	≤0.08	≥0.90	≤0.05	≥0.90	≤3

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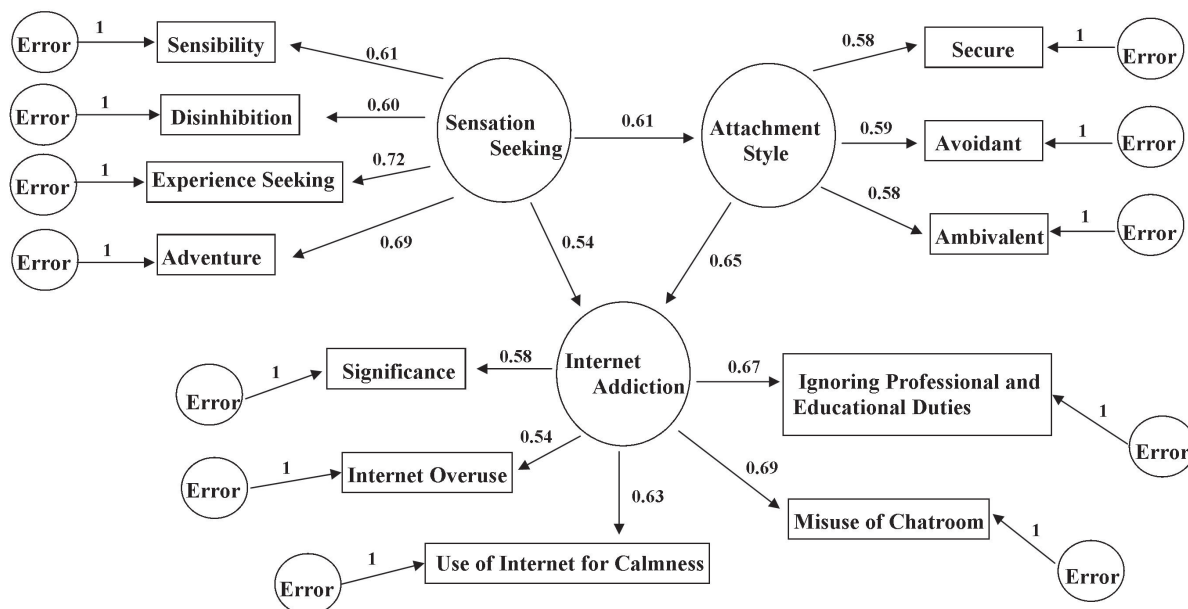
0.72 for sensation seeking, 0.53 to 0.59 for attachment styles, and 0.54 to 0.69 for Internet addiction (Figure 1).

The model's goodness of fit was estimated through: 1. Absolute fit indices (the ration of Chi-square to the degree of freedom or CMIN/df, the Goodness of Fit Indices (GFI) and the Root Mean square Residual (RMR)), 2. Comparative Fit Indices (CFI) and 3. Parsimonious fit index (the Root Mean Squares Error Approximation (RMSEA)). Table 4 shows the amount of each GFI of the proposed model, and Table 5 represents the acceptable level for each indicator of goodness of fit (Mulaik et al., 1981). Considering Table 4 and 5, there is a good fit between the model and data and all coefficients of paths were meaningful (Mulaik et al., 1981).

4. Discussion

The results showed that sensation seeking predicts Internet addiction both directly and indirectly. The results of the study, which indicated sensation seeking is directly intertwined with Internet addiction, are in accordance with the findings of Ko et al. (2006) who showed Internet addiction is related to the score of sensation seeking. The conclusion can be interpreted in this way: Internet searches facilitate adventure and help in exploring interesting and new phenomena for sensation-seeking people who easily get bored of repetition, predictable experiences and daily life issues and are after new and diverse experiences.

In fact, those individuals who are more adventurous and are risk taker than others find it really exciting and



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Figure 1. The proposed model after fitting for relationship among sensation seeking, attachment styles and internet addiction

brehtaking to contact with other people via Internet and its communication ways. Thus, they have more tendencies to discover or find unknown things through the use of Internet. These individuals probably find out that Internet is one of the best ways to satisfy their excitement dramatically. On the other hand, because their identity would not become known or identified on the net, they are more able to protect themselves from negative and unwanted consequences.

In addition, the results of the study indicated that attachment styles mediate the relation between sensation seeking and Internet addiction and that they also have a direct relationship with Internet addiction. This finding corresponds with the research results of Mikulincer and Shaver (2003) and Collins and Feeney (2004). For interpretation, it can be said that attachment plays an important role as a developmental factor and is one of the decisive variables in determining personal tendencies and integrating emotional, motivational and cognitive-behavioral components. Therefore, people with secure attachment style establish more intimate and better ties with others and enjoy more self-confidence.

Furthermore, they will less resort to addictive behaviors such as Internet addiction if there is a barrier to have appropriate connection with others. But, people who have insecure attachment style will resort to behaviors such as overuse of Internet to escape from hard situations, be relaxed or obtain the same level of natural safety-making ties if they fail to establish relation with other people. This may be because they have been deprived of natural and safe relationships and they feel anxious and distrust themselves and others. In other words, when a primary attachment target is not available, another solution to attain security is to search for alternative attachment targets, which can include non-human targets as well, e.g. material objects.

The outcomes of the study provide novel insights. Although all paths of the proposed model are meaningful and attachment styles mediate the relationship between sensation seeking and Internet addiction, the direct pathway between attachment styles and Internet addiction has the highest weightage. This finding suggests that working on attachment styles and modifying them or changing attachment styles and the level of sensation seeking concurrently can be more effective than merely regulating the degree of sensation seeking for dealing with or controlling Internet addiction.

This study has some limitations. Since the present research studied the relationships among sensation seeking, attachment styles and Internet addiction, the roles

of social and cultural elements on the intended variables were not considered. Moreover, the current study used convenience sampling, which minimized the generalization of the research findings. Eventually, our sample is limited in size and representativeness, e.g., all participants were university students. So, it is suggested that a culturally/demographically varied and larger sample would be beneficial for use in future work. Besides, additional questionnaire studies are necessary to get a more subtle picture about Internet addiction.

This study recommends teachers, school principals, university professors, and other officials to prepare programs such as attractive free-time activities, which appropriately meet sensation seeking needs of youths and teenagers as individuals who use Internet the most. Since disturbed family functioning and insecure attachment styles are often seen in Internet addiction, including other family members in the treatment of those with Internet addiction is important. It may be necessary to use an integrative approach that makes family participation in treatment mandatory to enhance the success rate of treatment for Internet addiction.

To sum up, sensation seeking predicts Internet addiction directly and without mediation forms and also with mediation of attachment styles and indirectly. Internet addiction is predicted directly by attachment styles. However, since attachment styles variable is noticeably effective on Internet addiction in the model, it can be more functional to focus on changing attachment styles or sensation seeking and attachment at the same time for a successful treatment of individuals with Internet addiction.

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Conflict of Interest

The authors declared no conflicts of interest.

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