

PSYCHOMETRIC PROPERTIES OF A TURKISH VERSION OF THE COMPULSIVE INTERNET USE SCALE

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Abstract

This study aimed to examine the psychometric properties of the Compulsive Internet Use Scale (CIUS) in a Turkish adolescent sample. The data were collected from 409 adolescents. The sample included 229 (56%) females and 180 (44%) males. The age of the participants ranged between 16 and 18 years with a mean age of 17.3 ($SD= 1.3$). Adolescent ages 16-18). First, the factor structure of the scale was examined and the results of the explanatory and confirmatory factor analyses showed that the CIUS is a one-dimensional construct. As for the convergent validity; the correlations of CIUS with measures of Internet addiction were examined. For divergent validity; the correlations of CIUS with measures of social and emotional loneliness and depression were examined. These results revealed strong correlations. Following, reliability was examined via internal consistency, test-re-test reliability coefficients and split-half correlation. Reliability analyses showed that the scale had high internal consistency, high test-retest and split half reliabilities. The results of the present study indicate that Turkish version of CIUS has good psychometric properties. Finally, findings were discussed in line with the relevant literature.

Keywords: Compulsive Internet use, adolescence, adaptation

The number of Internet users has been increasing tremendously. Although Internet use makes easy daily life, it has been accompanied by the

development of an excessive use and uncontrollable pattern (Khazaal et al., 2011). A rapid increase in the use of the Internet brings some problems for young people (Kim & Davis, 2009). Indeed, besides the many benefits of using Internet for communicating with others, the results of some studies indicated that Internet using might be associated with psychological problems (Beard & Wolf, 2001; Young, 1998). More clearly, past research has documented a relation between compulsive Internet use and psychological variables such as depression, self-esteem, shyness, social anxiety, impulsivity, and loneliness (Armstrong, Phillips, & Saling, 2000; Cao, Su, Liu, & Gao, 2007; Caplan, 2003; Chak, & Leung, 2004; Engelberg & Sjöberg, 2004; Nalwa & Anand, 2003; Whang, Lee, & Chang, 2003; Yen Ko, Yen, Wu, & Yan, 2007).

Internet use in Turkey has increased rapidly and has become a major part of daily life (Koç, 2011). Problematic Internet use is a growing concern among Turkish adolescents (Tahiroğlu, Celik, Uzel, Ozcan, & Avcı, 2008). One of the recent study, it was found that 4.5% of the participants (96.4% of the sample below the age of 16, 3.6% was aged 17 and above) can be diagnosed as Internet addicts (Cömert & Ögel, 2009). Adolescents are at high risk for negative effects of Internet and are thought to be more vulnerable to problematic Internet use (Johansson & Gotestam, 2004). Besides increasing number of studies which show the importance of problematic Internet use (Bayraktar & Gün, 2007), it is necessary to assess problematic Internet use among this group. Based on the need for measuring problematic Internet use in adolescent group, this study aimed at translating and adapting Compulsive Internet Use Scale (CIUS; Meerkerk, Van Den Eijnden, Vermulst, & Garretsen, 2009) into Turkish.

In recent years, several instruments have been developed to assess Internet use behavior such as Internet Addiction Test (Young, 1998), the Pathological Internet Use scale (Morahan-Martin & Schumacher, 2000), and the Generalized Problematic Internet Use Scale (Khazaal et al., 2011). There are also some developed (Ceyhan, Ceyhan, & Gürcan, 2007), and adapted scales for assessing Internet use behavior in Turkish sample (Kesici and Şahin, 2010; Canan et al., 2010). Unidimensional structure and shortness of the CIUS make it easier to use for screening in clinical settings and in online studies (Meerkerk, et al., 2009; Khazaal et al., 2011). Therefore, it is important to study on Turkish validation of this short questionnaire. The purpose of the present study was to adapt the CIUS into Turkish and to conduct validity and reliability studies of the scale.

Method

Participant

The data were collected from 409 adolescent. The sample included 229 (56%) females and 180 (44%) males. The adolescent was randomly selected from high schools in a small-sized city in western Turkey. Validity study involved 268 high school students from two different high schools. The sample included 151 (56%) females and 117 (44%) males. The mean age of the sample was 17.03 years (*SD* 1.1 years; range 16-18 years). For reliability analysis, 141 high school students from one high school (79 female and 62 male) completed the CIUS. The age of the participants ranged between 16 and 18 years with a mean age of 17.3 (*SD*= 1.3).

Depression was controlled for both data. For this purpose, students with high scores on the depression scale (7 student in first, 5 students in the second data set), who may use the Internet more in order to avoid social interaction, was excluded.

Procedure

CIUS was administered to the participants at their school. Students individually completed the questionnaires in group sessions, with an overall administration time of approximately 25 minutes. All participants were volunteers, and were allowed to withdraw at any point. The researcher explained the purpose of the study and assured the students of the confidentiality of their responses. No personal identifying information was collected. Eight participants were dropped from the study due to incomplete data. Students were asked to complete questionnaires including measures of compulsive Internet use and Internet addiction, depression and social loneliness. The data were collected in 2012.

Instruments

Compulsive Internet Use Scale (CIUS; Meerkerk et al., 2009). The CIUS consists of 14 items on a 5-point Likert scale (“never” to “very often”) and scores between 0 and 56. The scale items identifying the core features of compulsive Internet use. These core features are (a) preoccupation or salience (e.g., “How often do you look forward to your next Internet session?”), (b) loss of control (e.g., “How often do you find it difficult to stop using the Internet when you are online?”), and (c) continued use of Internet despite the intention to stop (e.g., “How often have you unsuccessfully tried to spend less time on the Internet?”). A high mean score indicated a high level of CIUS. It has a high internal consistency (Cronbach’s alpha=.89). High correlations with convergent and divergent variables demonstrate good validity. Pearson correlations between the CIUS and the

OCS scales (pathological Internet Use) were high and significant with $p < 0.001$.

The original CIUS was independently translated from English into Turkish by two experts in psychology. The translation was checked by two bilingual experts with graduate degrees in psychology. Consensus was reached on a common draft by these experts. The opinions of the expert panel converged for 92 % of the items. Discrepancies were evaluated to ensure the conceptual equivalence of the English and Turkish items (Van de Vijver & Leung, 1997).

Internet Addiction Test (IAT; Young, 1998).

IAT adapted to Turkish by Bayraktar (2001). The IAT consists of 20 items with a six point Likert scale ranging from “rarely” to “always”. IAT author guidelines recommend that participants scoring less than 40 be categorized as average users, those scoring between 40 and 59 be categorized as moderate Internet users, and those scoring 60 or above be categorized as excessive users. The content of the items includes the impact of Internet use on social interactions and the influence of Internet use on everyday life (e.g. “How often do you choose to spend more time online over going out with others?”). The Cronbach’s alphas for the six factors ranged from .54 to .82 (Widyanto & McMurrin, 2004).

Beck Depression Inventory (BDI; Beck, Rush, Show, & Emery, 1979).

The BDI scale with 21 items was adapted to Turkish by Hisli (1989). Each of the 21 items consists of four sentences anchored by 0 = absence of a depressive symptom to 3 = the highest degree of the symptom. The Cronbach alpha and split-half reliability coefficients were .80 and .74, respectively. The Pearson correlation coefficient between MMPI-D and BDI was .63.

Social and Emotional Loneliness Scale for Adults-Short Form (SELSA-S; DiTommaso, Brannen, & Best, 2004).

The SELSA-S is a 15-item scale designed to measure emotional (romantic and family) and social loneliness. The items are rated on a 7-point scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Higher SELSA-S scores indicate higher levels of emotional and social loneliness. Studies have indicated that it is a reliable and valid measure of loneliness. The internal consistencies of the SELSA-S subscales are high, with alphas ranging from .87 to .90 (DiTommaso et al., 2004). The 15-item SELSA-S was adapted into Turkish by Çeçen (2007). The Cronbach’s alphas for the adaptation study were: .83 for the romantic loneliness subscale, .77 for the family subscale and .74 for the social loneliness subscale.

Results

Validity

The data and sample size were adequate for the analyses when the following two criteria were taken into consideration: The Kaiser- Meyer-Olkin (KMO) and Bartlett Test of Sphericity (BTS). KMO and BTS results indicated the data satisfied the psychometric criteria for factor analysis. KMO analysis yielded an index of .90, Tabachnick and Fidell (2001) suggested that values greater than .60 are required for factor analysis. Bartlett's test of sphericity was significant ($\chi^2(190, N = 268) = 1796.304 p < .001$) and this value supported to the factorability of the correlation matrix.

The distribution of the variables was controlled using skewness (an index of how much steeper the distribution of scores) and kurtosis (an index of asymmetry of distribution) value. All values were less than 1, ranging from 0.10 to 0.56 for skewness and from 0.094 to 0.71 for kurtosis, indicating that there was no problem with normal distribution.

A principal component analysis and Varimax rotation was computed on the CIUS. The number of components to be extracted was determined by (a) eigenvalues above 1.0 and (b) Cattell's scree test. The results showed that only one factor was extracted with eigenvalue of 7.69 accounting for 51% of the variance and all items loaded greater than .30 on this factor.

Confirmatory factor analyses (CFA) were conducted by using the LISREL 8.30 to determine whether the one-factored constructs in the original CIUS via maximum likelihood estimation. Goodness-of-fit indicators for the CIU are shown in Table 1.

Table1. The Results of Confirmatory Factor Analyses on the CIUS

Index	CFA
Chi-Square / df	252.87/77 = 3.2
GFI (Goodness of Fit Index)	.89
AGFI (Adjusted Goodness of Fit Index)	.94
RMSEA (Root Mean Square Error of Approximation)	.09
CFI (Comparative Fit Index)	.95
IFI (Incremental Fit Index)	.95
NFI (Normed Fit Index)	.92
NNFI (Non-normed Fit Index)	.96

For adolescence, the goodness of fit indices obtained from the two CFA indicated that the data for versions of the Turkish CIUS fitted well to the one-factor model of compulsive Internet use.

Table2.
Lambda (λ), t -values, standard errors and R^2

Items	λ	t	SH	R^2
1. Do you find it difficult to stop using the Internet when you are online?	1.00	17.25	.05	.66
2. Do you continue to use the Internet despite your intention to stop?	.95	13.96	.06	.58
3. Do others (e.g., partner, children, and parents) say you should use the Internet less?	.92	10.91	.08	.38
4. Do you prefer to use the Internet instead of spending time with others (e.g., partner children, parents)?	.56	7.42	.07	.30
5. Are you short of sleep because of the Internet?	.65	7.75	.07	.35
6. Do you think about the Internet, even when not online?	.84	11.71	.07	.45
7. Do you look forward to your next Internet session?	.89	12.14	.07	.44
8. Do you think you should use the Internet less often?	.57	6.58	.08	.20
9. Have you unsuccessfully tried to spend less time on the Internet?	.70	8.92	.07	.38
10. Do you rush through your (home) work in order to go on the Internet?	.74	11.02	.06	.42
11. Do you neglect your daily obligations (work, school, or family life) because you prefer to go on the Internet?	.43	11.02	.06	.29
12. Do you go on the Internet when you are feeling down?	.70	8.97	.07	.31
13. Do you use the Internet to escape from your sorrows or get relief from negative feelings?	.69	8.24	.08	.27
14. Do you feel restless, frustrated, or irritated when you cannot use the Internet?	.73	9.99	.07	.40

R^2 values in Table2 showed that explained variance in latent constructs change between .20 and .66 and it was found that explained variance in many items higher than .50. Also t values showed that the 14 item scale is a reliable indicator to latent variable of compulsive Internet use. In sum, the results of confirmatory factor analyses provided further support for the construct validity of the CIUS.

Convergent and Divergent Validity

Based on literature which indicated sex differences in compulsive Internet use that is boy gender was possibly linked to compulsive Internet use (Chen, 2000; 2008; Khazaal et al, 2008), possible gender differences were analyzed before the convergent and divergent validity analyses. By means of t -tests (Independent samples t -test), the scores of the CIUS of male participants were compared to those of female participants. t -test results revealed that there was a significant difference between male and female participants on the CIUS scores. Boys scored significantly higher than girls ($t = 2.65, p < 0.001$).

To examine the convergent validity of the CIUS, correlations between this measure and the Internet Addiction Scale were examined.

Evidence of convergent validity was provided by correlating scores on the CIUS with the IAT. Consistent with the expectations, the correlation (Pearson correlations) between the CIUS and the IAT scores was good; 0.76 ($p < 0.01$). These findings supported the expectations and provided evidence for the convergent validity of CIUS.

Divergent validity was explored by correlating the CIUS scores with social loneliness and depression symptoms scores. Correlations between CIUS and depression symptoms ($r = .35, p < .01$) and social and emotional loneliness scores ($r = .42, p < .01$) were moderate as expected.

Reliability

For reliability, the Cronbach's alpha coefficient was calculated. The internal consistency coefficient score of the scale was .91. The correlation coefficient between the first and second implementation of the CIUS was .89. The test-retest reliability coefficient suggests that the scores obtained through the CIUS are considerably stable over a two week period.

For reliability of the scale, item-total correlations were calculated. Item-total correlations ranged from .47 to .75 for the 14 items. It indicated that all items measured the same construct as the scale. For each item, the differences between mean scores of upper 27% and lower 27% groups were examined and t values revealed significant differences, values changed between 8.84 ($p < .000$) and 18.12 ($p < .000$).

Discussion

The aim of the present research was to examine the psychometric properties of the CIUS in a Turkish sample. The psychometric properties of the Turkish CIUS have been examined via exploratory and confirmatory factor analysis, internal consistency, convergent and divergent validity methods. Similar to the original form, exploratory factor analysis revealed one-factor structure. One factor model was also consistent with the result of Arabic (Khaazal et al., 2011), French (Khazaal et al., 2012) and German adaptation (Peukert, 2012). This one factor form was examined via confirmatory factor analyses. According to the results of the CFA, goodness of fit indexes regarding the single factor structure was sufficient and it is possible to say that the one factor structure of the scale was confirmed.

Consistent with the studies which shows that men are more addicted than women (e.g. Zanetta Dauriat et al, 2011; Chen, 2000; 2008; Khazaal et al, 2008), significant relationship was found between CIUS scores and gender.

Results of convergent validity indicated significant relationships between Turkish CIUS and Internet Addiction Test. The divergent validity of CIUS was further assessed by means of correlating it with scores on

measures assessing loneliness and social and emotional loneliness. The results revealed that CIUS was moderately related to loneliness and depression. These findings can be evaluated as proof of the validity of the Turkish CIUS. Additionally, reliability analysis indicated that both the internal consistency and test-retest reliability estimates of the CIUS were adequate.

Despite the rapid growth in the problematic Internet use (Tahiroğlu et al., 2008) and its association with ill-being (Cao et al, 2007; Young, 1998), there are few instruments to measure compulsive Internet use. To study excessive Internet use, validity, reliable and useful measurement is prerequisite. Thus, CIUS measures problematic internet use other than related psychosocial well-being and is also based on more unambiguous conceptual structure. Because of this scale can reflect the severity of the underlying compulsion or addiction, it would be useful for further study to identifying groups at risk. It is brief scale which makes it possible to combine the instrument with other measures without threatening response rates (Khaazal et al., 2011). Additionally, because of its terseness, it is appropriate for the clinical setting and online implementation (Meerkerk, et al., 2009).

The main limitations of the present study are in the sampling of participants, who were young and our findings do not generalize to addictive in clinical population. The present studies addressed convergent and divergent validity. Procedures to assess other forms of validity (e.g., predictive and incremental validity) need to be addressed in future research.

As a result, according to the obtained results, the Turkish form of the CIUS possesses satisfactory psychometric properties as a measure of compulsive Internet use. Although the results of this study revealed sufficient psychometric properties of this sample, further studies with different samples and age groups should be done.

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