

Associations of Social Anxiety and Depression with Cognitions Related to Problematic Internet Use in Youths

Gençlerde Sosyal Kaygı ve Depresyonun Problemlı İnternet Kullanımıyla İlgili Bilişlerle İlişkisi

Mithat DURAK*

Emre ŞENOL-DURAK**

Abant İzzet Baysal Üniversitesi

Abstract

Presence of psychopathology (e.g., depression and anxiety) has found to be related to an increased vulnerability to develop problematic Internet use (PIU). The current study aimed to investigate the effects of social anxiety and depression on cognitions related to PIU based on a cognitive behavioral framework in youths. The Online Cognition Scale (OCS), The Beck Depression Inventory (BDI), The Liebowitz Social Anxiety Scale (LSAS) and Demographic Information Form were administered and hierarchical multiple regression analyses were used to ascertain these effects as well as to determine the roles of socio-demographic variables (age, gender, type of residence, and monthly income), romantic relationship status, and time spent online, using a sample of 448 Turkish university students aged 18 to 25 years. The results revealed significant effects of gender (being male) and time spent online on cognitions about PIU. However, the effects of romantic relationship status were found to be insignificant. Fear/anxiety and depression were positively correlated with cognitions about PIU. Avoidance was not found to be correlated with cognitions about PIU. Examining the roles of social anxiety and depression in PIU will improve our understanding of PIU and contribute to the design of future studies.

Keywords: Problematic Internet use, cognitions, social anxiety, fear/anxiety, avoidance, depression, youths

Öz

Psikopatolojinin varlığının (örneğin depresyon ve kaygı), sorunlu İnternet kullanımına yatkınlığı arttırdığı ortaya konmuştur. Bu çalışmanın amacı, bilişsel davranışçı yaklaşım çerçevesinde sosyal kaygının ve depresyonun sorunlu İnternet kullanımı ile ilgili bilişler üzerindeki etkisini gençler üzerinde araştırmaktır. Çalışmaya, 18-25 yaş aralığındaki 448 üniversite öğrencisi katılmıştır. Sosyal kaygının ve depresyonun etkisinin yanı sıra sosyodemografik değişkenlerin (yaş, cinsiyet, ikamet türü ve aylık gelir), romantik bir ilişkiye sahip olmanın ve İnternet başında geçirilen zamanın sorunlu İnternet kullanımı ile ilgili bilişler üzerindeki etkisini araştırmak amacıyla çoklu hiyerarşik regresyon analizleri gerçekleştirilmiştir. Elde edilen bulgular, cinsiyetin (erkek olmanın) ve İnternet başında geçirilen zamanın sorunlu İnternet kullanımı ile ilgili bilişler üzerindeki etkisinin anlamlı olduğunu göstermiştir. Bununla birlikte romantik bir ilişkiye sahip olmanın sorunlu İnternet kullanımı ile ilgili bilişler üzerindeki etkisi anlamsızdır. Korku-kaygı ve depresyon, sorunlu İnternet kullanımı ile ilgili bilişler ile pozitif korelasyon göstermiştir. Bununla birlikte kaçınmanın sorunlu İnternet kullanımı ile ilgili bilişler üzerindeki etkisi anlamsızdır. Sosyal kaygının ve depresyonun sorunlu İnternet kullanımı ile ilgili bilişler üzerindeki rollerinin araştırılmış olması, ileride bu alanda yapılacak araştırmalara katkı sağlayacaktır.

Anahtar Sözcükler: Problemlı İnternet kullanımı, bilişler, sosyal kaygı, korku/kaygı, kaçınma, depresyon, gençler

*Doç. Dr. Mithat DURAK, Abant İzzet Baysal Üniversitesi, Edebiyat Fakültesi, Psikoloji Bölümü, mithat@mithatdurak.com

**Doç. Dr. Emre ŞENOL-DURAK, Abant İzzet Baysal Üniversitesi, Fen-Edebiyat Fakültesi, Psikoloji Bölümü, emre@emresenoldurak.com

Introduction

Insensitive Internet usage results in several psychological issues. Problematic Internet use (PIU) is a term recently started to be used to explain problems related to Internet use (Davis, Flett, & Besser, 2002). A number of cognitive and behavioral symptoms are associated with PIU. Impulse control problems, obsessions (Young, 1999), being online for long hours (Morahan-Martin & Schumacher, 2000) feelings of guilt related to be online (Caplan, 2002), and being online to get rid of one's problems (Caplan, 2002) are some symptoms of PIU. Those individuals suffer from some problems in their relationship with society (Douglas, Mills, Niangs, Stepchenkova, Byun, Ruffini, et al., 2008; Kraut, Patterson, Lundmark, Kiesler, Mukopadhyay, & Scherlis, 1998) and family (Ozcan & Buzlu, 2007).

The cognitive behavioral perspective on the development and maintenance of PIU has been mentioned in the literature. In this perspective, maladaptive cognitions about oneself and the outside world (Davis, 2001) and behaviors decreasing adaptability (Caplan, 2002; Young, 1999) have roles in the development and maintenance of PIU. Some of these maladaptive cognitions about the self includes negatively focused cognitive style and self-appraisal, low self-efficacy, and suspecting self (Davis, 2001). Additionally, some maladaptive cognitions about the world involve generalization of negative events and black or white thinking (Davis, 2001). The relevant dysfunctional behaviors include an inability to fulfill their family or work related responsibilities (Caplan, 2002). According to the results of a research, when individuals having higher scores of psychological distress preferred online social interaction rather than face-to-face communication, they had higher scores on negative outcome measures (Caplan, 2003). Likewise, these dysfunctional cognitions and behaviors are "consequences" of the presence of psychopathology and they are not "causes" (Caplan, 2002, p. 557). Moreover, Davis (2001) highlighted that on the basis of diathesis stress relationship, Internet use does not lead to depression; on the contrary, presence of psychopathology triggers maladaptive cognitions related to Internet use. In the presence of a diathesis, stressors or proximal factors, such as use of new technologies (e.g., a chat service) exacerbate PIU.

In an effort to explain PIU, theoreticians have investigated such factors as age, gender, income, type of residence, time spent online, social interpersonal relationships, and psychological problems (i.e., depression, social anxiety). As for the effect of age, age has a negative correlation with PIU which puts younger Internet users at more risk to develop PIU. Age has a negative correlation with PIU which increases the probability to having high scores of PIU for younger Internet users. (Soule, Shell, & Kleen, 2003). This result is not generalizable, though, because the oldest group in this study was 24 years old and the youngest group was only five years younger. When the effect of gender was taken into consideration, males had significantly higher PIU scores than females (Ozcan & Buzlu, 2007; Tsai, Cheng, Yeh, Shih, Chen, Yang, et al., 2009; Young, 1998). However, conflicting results have been reported in the literature. For example, in one study, middle-aged females were more vulnerable to PIU than males (Soule et al., 2003). In other studies, one with a sample of college students (Lanthier & Windham, 2004) and another with a sample of adolescents (Kim, Ryu, Chon, Yeun, Choi, Seo et al., 2006), Internet use frequencies did not significantly differ based on gender. When the effect of income was analyzed, there were no significant income differences between light, moderate and heavy Internet users (Kim, Lau, Cheuk, Kan, Hui & Griffiths, 2010). To reveal the effect of income in Turkish culture, this variable is selected. Individuals with higher income are expected to have higher chances to have access to the Internet. In regard to the effect of residence type, no significant correlation was found with Internet use (Daneback, Mansson, & Ross, 2007). However, in terms of producing available conditions to reach Internet, residence type might influence Internet users. For instance, while Internet is available in all dormitories, it is not the case for every household.

Positive correlations have been found between the length of time spent online and compulsive Internet use (Meerkerk, van den Eijnden, Franken, & Garretsen, 2010). The length of time spent online can be accepted as one example of dysfunctional behavior. As such, being online for more than four hours per day is considered heavy use (Kim et al., 2010). Heavy users have lower levels of self-esteem, as one study has argued which may be a result of using the Internet as a form of escapism (Armstrong, Phillips, & Saling, 2000). In another study, time spent online affected psychological well-being through the effect of compulsive Internet use (van der Aa et al., 2009). Besides, increment in the time spent online decreases social integration which negatively affects psychological well-being (Weiser, 2001).

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In addition to the time spent online, having poor interpersonal relationships is considered to be a risk factor. Individuals with PIU reported poorer interpersonal relationships than those without it (Yang & Tung, 2007). Social interaction with others has effects on the etiology, development and outcome of PIU (Caplan, 2002). Yang and Tung (2007) found that peer relationship difficulties differed between adolescents with PIU and those without it. Individuals having PIU experience more problems in school, family and social domains compared to their counterparts, and these participants report to acknowledge that Internet causing familial, school-related problems in their lives. Individuals who do have a romantic partner might use Internet to find a romantic partner. For instance, attempting to establish a romantic relationship while online was found to be more important for men than for women (Kim & Davis, 2009) and men might be more assertive than women while being online. To our knowledge, it has not yet been reported in the literature whether having a romantic relationship has a significant association with cognitions about PIU or not. This variable can also be considered as a part of PIU as Internet use leads difficulty in maintaining relationships (Douglas et al., 2008; Ozcan & Buzlu, 2007).

The impact of an individuals' psychological well-being (as defined by the presence or absence of depression and/or anxiety, Spielberger & Reheiser, 2009) on PIU has been investigated. Literature findings reveal co-morbidities between PIU and social anxiety disorders (Shapira, Goldsmith, Keck, Khosla, & McElroy, 2000), sexual compulsion, loneliness, depression and bipolar disorder (Morahan-Martin, 2005). By the same token, social isolation is accepted as an important antecedent of PIU (Douglas et al., 2008). It is assumed that socially anxious individuals cope with their social fears (Shepherd & Edelman, 2005) and satisfy their social needs via the Internet because these individuals are attracted to the perceived "safety" of the Internet (Mckenna & Bargh, 2000).

In addition to the effect of individuals' psychological well-being on PIU, the effect of Internet use on psychological well-being has been examined as well. Kraut and his colleagues (1998) revealed that PIU has a negative effect on psychological well-being. They found in their longitudinal research that the social connectedness and psychological well-being of adolescents decreased due to the effect of Internet use over a period of one year.

Besides its negative effects, Internet use also affects individuals positively. For instance, decrement in stress, depression, (Chou, 2001) depressed mood, (Meerkerk et al., 2010) or negative moods (Morahan-Martin, 2005) and negative thinking (Mazalin & Klein, 2008) are some of its positive effects. Additionally, individuals satisfy their social needs (Mckenna & Bargh, 2000) and sense of belonging (Shepherd & Edelman, 2005) by means of Internet use. Their social support (Hampton & Wellman, 1999) and online competency (Mazalin & Klein, 2008) increase as well.

Conflicting findings related to positive and negative effects of the Internet use on psychological well-being have also been demonstrated empirically. Both a negative correlation (Young & Rodgers, 1998) and a positive correlation between PIU and depression, (Kraut et al., 1998) were reported in the literature. Similar to Kraut et al., (1998), Yang and Tung (2007) found that individuals with higher depression scores had a tendency to have PIU. In addition, individuals who were less comfortable in face-to-face relationships used the Internet to engage in social interactions (Papacharissi & Rubin, 2000). These conflicting findings demonstrate that the relationship between PIU and psychological well-being may be explained by the effects of other variables. For instance, one study evaluated the effects of Internet use motives (i.e., communicative and non-communicative, e.g., surfing) on depression and anxiety (Selfhout, Branje, Delsing, ter Bogt, & Meeus, 2009). They found that whereas individuals using the Internet for communicative purposes were less likely to suffer from depression, individuals using the Internet for non-communicative purposes were more likely to suffer from both depression and social anxiety.

Aims and Hypotheses

Cognitive dysfunctions may be a consequence of difficulties in social interactions due to feelings of anxiety in social contexts. Additionally, the state of low mood, social isolation and decrement in physical activities lead to cognitive deficits such as difficulty in concentration, remembering details and decision-making. For these reasons, within the cognitive behavioral theory (Caplan, 2002 Davis, 2001), the present study aimed to examine the roles of depression and social anxiety in cognitions regarding PIU. In addition, current findings revealing the impact of variables on PIU were considered. Also, type of residence and romantic relationship status were examined as these variables are sensitive to reveal collective values. As far as we know, this cognitive behavioral model has not been tested yet. Therefore, after controlling the impacts of

such variables cited in the literature (age, gender, type of residence, monthly income, romantic relationship status, and time spent online), the associations between depression and cognitions regarding PIU as well as the associations between social anxiety and cognitions regarding PIU were tested in the present study. Considering all of the literature findings mentioned above, a set of analysis will be run for the associates of cognitions about PIU:

After controlling for possible effects of the socio-demographic variables (i.e., gender, age, income, type of residence and romantic relationship status); *Hypothesis 1 (H1)*: Higher time spent online will be associated with cognitions about PIU.

After controlling for possible effects of the socio-demographic variables and time spent online; *Hypothesis 2 (H2)*: Higher fear/anxiety and higher avoidance will be associated with cognitions about PIU.

After controlling for possible effects of the socio-demographic variables, time spent online and social anxiety (i.e. fear/anxiety and avoidance); *Hypothesis 3 (H3)*: Higher depression will be associated with cognitions about PIU.

Method

Participants

A total of 448 students, 271 females (60.5%) and 177 males (39.5%) participated in the study. Ages of the students ranged between 18 and 25 years ($M = 20.53$, $SD = 1.53$). Monthly family income mean was 1.320.29 Turkish Liras (TL) (880.19 USD) ($SD = 733.42$ TL or 488.95 USD). It was ranged between 400 to 5000 (266.67 USD to 3333.33 USD). Of the total sample, 137 students (30.6%) were in a romantic relationship, and 311 of them (69.4%) were not. With regard to their housing, 31.5% of the subjects were living in a flat with roommates ($n=141$), 30.4% were living in a campus dormitory ($n=136$), 29% were living in a private dormitory ($n=130$), and 9.2% were living with their families ($n=41$). All students can access the Internet free of charge for 24 hours a day in the dormitory or in the university campus. The majority ($n = 412$; 92%) of the participants' parents lived together, and 1.1% of the participants' parents were separated ($n=5$). Further, 1.3% had parents who were divorced ($n=6$), 0.9% of participants had mothers who were deceased, and 4.7% of them had fathers who were deceased. The mean daily amount of time spent online was 110.89 minutes ($SD = 89.40$), ranging from 30 minutes to 600 minutes.

Measures

A *Demographic Information Form* was prepared to collect data from the participants regarding age, gender, type of residence and romantic relationship status.

The *Online Cognition Scale* (OCS) evaluates cognitions about PIU and consists of 36 items that rated on 7-point Likert scales (Davis et al., 2002). Exploratory factor analysis results revealed that the scale had four subscales, namely diminished impulse control, loneliness/depression, distraction, and social comfort. Some examples of the items are "I get more respect online than in real life;" "I often keep thinking about something I experienced online well after I have logged off;" and "Using the Internet is a way to forget about the things I must do but really don't want to do." Regarding the Turkish standardization of the scale test-retest reliability was .90 for five-week interval and internal consistency was .93 (Ozcan & Buzlu 2007). Internal consistency of the scale was found .93 in the present study.

The *Beck Depression Inventory* (BDI) is aimed to evaluate emotional, motivational and cognitive symptoms of depression with 21 items. Items are rated on 4-point Likert-type scales (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). In the Turkish adaptation of the scale, split-half reliability was .74 and concurrent validity (MMPI Depression subscale) was .63 (Hisli, 1988). Internal consistency of the scale was .88 in the present study.

The *Liebowitz Social Anxiety Scale* (LSAS) was developed by Liebowitz (1987) to assess social interaction and performance with 24 items rated on 4-point Likert-type scales. Two dimensions of the scale are fear/anxiety and avoidance. Internal consistency of the scale is reported to be .96 (Heimberg et al., 1999). Regarding the Turkish standardization of the scale internal consistency of the scale was .95 (Soykan, Ozguven & Gencoz, (2003). Internal consistency of the scale was .90 for fear/anxiety and avoidance in the present study.

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Procedure

In order to collect data from university students, classroom setting was preferred. After giving information about the aim of the study, and obtaining the informed consent form, questionnaires were administered by the authors of the manuscript to students from different departments (i.e. food engineering, environmental engineering, architecture, mathematics, history, psychology, biology, chemistry, economics, international relations, business administration, education sciences, primary education, fine arts education, sport management). It took 30 minutes to complete the questionnaires. All participants voluntarily participated in the present study.

Results

Descriptive Statistics and Correlations among Variables

Descriptive results and correlations among the variables are presented in Table 1. As can be seen from Table 1, OCS scores were correlated with depression, fear/anxiety, avoidance, and time spent online.

In terms of socio-demographic variables, gender ($r=.17$) and residence type ($r=-.13$) were significantly correlated with cognitions about PIU. An independent-samples t-test was conducted to compare cognitions about PIU in "males" and "females". There was a significant difference in the scores for "males" ($M = 84.05$, $SD = 33.15$) and "females" ($M = 73.20$, $SD = 28.61$) conditions; $t(446) = -3.683$, $p = .000$. A one-way between subjects ANOVA was conducted to compare the effect of residence type on cognitions about PIU in "living with family members", "living in a campus dormitory", "living in a flat with roommates", and "living in a private dormitory". There was a significant effect of residence type on cognitions about PIU at the $p < .05$ level for the four conditions [$F(3, 444) = 3.065$, $p = .028$]. The Student-Newman-Keuls post hoc comparison test indicated that the mean score for living with family members ($M = 90.07$, $SD = 41.98$) was significantly higher than "living in a campus dormitory" ($M = 78.70$, $SD = 31.24$), "living in a private dormitory" ($M = 75.21$, $SD = 28.05$), and "living in a flat with roommates" ($M = 74.64$, $SD = 28.51$). However, there was no significant difference between these conditions "living in a campus dormitory", "living in a flat with roommates", and "living in a private dormitory".

Table 1.

Descriptive statistics of the variables and the correlations and among the variables

	1	2	3	4	5	6	7	8	9	10
1. OCS		.42**	.18**	.17**	.36**	.04	.17**	.01	.03	-.13**
2. Depression			.27**	.30**	.12*	.03	-.01	-.04	.05	-.10*
3. Social Anxiety				.77**	-.11*	-.11*	-.08	-.07	-.07	-.02
4. Social Avoidance					-.11*	-.09	.01	-.03	-.05	-.06
5. Time spent minute						.09	-.01	.09	.03	-.15**
6. Age							.14**	-.04	.12*	-.09*
7. Gender								-.04	.04	.00
8. Monthly income									.08	-.06
9. Romantic Relation										-.04
10. Residence Type										
Mean	77.48	11.23	26.39	22.46	110.89	20.53		1320.29		
Standard Deviation	30.91	8.45	12.19	12.18	80.4	1.53		733.42		
Possible Range	36-252	0-63	0-72	0-72	30-600	18 - 28		400 - 5000		

*p < .05. **p < .01. ***p < .001

Variables Related to Cognitions about Problematic Internet Use

Hierarchical multiple regression analyses were conducted to reveal significant relationships with variables (socio-demographic variables, time spent online, social anxiety and depression) and cognitions about PIU. Variables in the present study were entered into the equation via four steps. To control the possible effects of socio-demographic variables (i.e., gender, age, monthly income, romantic relationship status, type of residence), these variables were entered in the first step.

After controlling for the socio-demographic variables that were significantly associated with the dependent variable, time spent online was entered in the second step. For the third step, social anxiety (fear/anxiety and avoidance) was entered. In the last step, depression was entered into the equation.

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Table 2.

Variables Associated with the OCS (Dependent Variable: Total cognitions about problematic Internet use)

Predictors in set	F for set	df	B	SE	Beta (β)	t for w/in set predictors	Model R ² change
I. <i>Control variables</i>	4.231***	5, 442					.046
Age		442	-.02	.961	-.001	-.024	
Gender		442	10.84	2.97	.172	3.653***	
Monthly income		442	.00	.00	.004	.091	
Romantic relation.		442	1.46	3.15	.022	.464	
Residence		442	-2.41	.91	-.124	-2.655**	
II. <i>Time</i>	62.392***	1, 441					.118
Time online daily		441	.12	.02	.350	7.899***	
III. <i>Social anxiety</i>	15.438***	2, 439					.055
Fear or anxiety		439	.49	.17	.193	2.865**	
Avoidance		439	.14	.17	.055	.821	
IV. <i>Depression</i>	67.506***	1, 438					.104
Depression		438	1.27	.15	.347	8.216***	

Note 1. For gender variable; 1= female, 2= male *Note 2.* For residence variable; 1= living with family, 2= living in a campus dormitory, 3= living with friends 4= living in a private dormitory *Note 3.* *p < .05. **p < .01. ***p < .001.

Regarding the regression analysis run for the Online Cognition Scale (OCS) (see Table 2), among the control variables, gender (being male) ($\beta = .17$, $t(442) = 3.65$, $p < .001$), and type of residence (living with family) ($\beta = -.12$, $t(442) = -2.66$, $p < .01$) were significantly associated with the OCS, and all these variables explained 5% of the variance ($F[5, 442] = 4.23$, $p < .001$). After controlling for this factor, time spent online revealed a significant association with the OCS, and with the entrance of this variable, explained variance increased to 16% (F change $[1, 441] = 62.39$, $p < .001$). Following time spent online, social fear/anxiety ($\beta = .19$, $t(439) = 2.87$, $p < .01$) had a significant association with the OCS; with the entrance of all social anxiety dimensions, explained variance increased to 22% (F change $[2, 439] = 15.44$, $p < .001$). Following the social anxiety dimensions, depression ($\beta = .35$, $t(438) = 8.22$, $p < .001$) had a significant association with the OCS, and with the entrance of this variable, explained variance increased to 32% (F change $[1, 438] = 67.51$, $p < .001$).

Discussion

Within the cognitive behavioral framework established by Caplan (2002) and Davis (2001), in addition to determining the effects of socio-demographic variables (age, gender, type of residence, and monthly income), romantic relationship status and time spent online, the purpose of this study was to determine the effects of social anxiety and depression on cognitions about PIU. In the analysis, among the socio-demographic variables, gender had a significant effect on cognitions related to PIU. Consistent with Ozcan and Buzlu's (2007) results, males had higher scores on the OCS than did females. Tsai and his colleagues (2009) found the same results with a sample of first-year university students using different measures. However, a gender effect was not found in a sample of college students (Lanthier & Windham, 2004) and in a sample of adolescents (Kim et al., 2006). Therefore, insignificant results in gender literature may be explained by the effects of sample characteristics and cultural values. On the basis of sample characteristics, university students have different beliefs, values and life expectancies than adolescents. As for cultural explanation, the significant gender effect was found in the present study and in the Ozcan and Buzlu's (2007) study both of which were conducted in Turkish samples. In Turkey, men are more likely to have online-Internet resource than women. Moreover, despite the fact that an effect

of age on cognitions about PIU was found in various studies (Thatcher & Goolaam, 2005), no significant effect related to age was found in the present study. This result may be related to lower variance of the age of the subjects. Likewise, consistent with the findings of Kim et al. (2010), the effects of monthly income on cognitions was not found to be significant. Therefore, neither age nor monthly income has effect on PIU. Results related to income can be interpreted that Internet use is extended among individuals in all socio-economic status.

In addition to these variables, romantic relationship status was also examined. In the present study, it was revealed that whether one has a romantic relationship or not does not have an impact on such cognitions. In other words, Internet use is independent of one's relationship status despite the fact that individuals with PIU reported poorer interpersonal relationships than their counterparts (Yang & Tung, 2007). In the present study, how the romantic relationship is going on is not questioned. The quality of romantic relationship might be more important than the presence of it. Therefore, this variable should be examined deeper in future studies. Moreover, the association of the type of residence variable with cognitions about PIU was examined for the first time. In literature Danebak and his colleagues (2007) found no significant effect of type of residence on Internet use, the present study demonstrated the effect of residence type on cognitions about PIU. Participants living with their families had higher scores on cognitions about PIU than those living in a flat with roommates, in a campus dormitory or in a private dormitory. Participants living with their families could reach each web site. Results related to residence type might be affected by control mechanisms like this. Besides, young students living with their families do not have not as much responsibilities as the ones living in a dormitory or a flat with a roommate etc. So they can have plenty of time to be online. At the same time, they can easily explain the reason of being online to their families as " I am studying about my homework etc". Therefore, their time spent online might not discontinue.

Beyond the effects of socio-demographic variables (gender and residency) and romantic relationship status, the effect of time spent online was also found to be significant. Therefore, our first hypothesis (*H1*) was partially supported. When the duration of Internet use increased, individuals had higher scores on the OCS. In other words, individuals who used Internet for longer durations felt more lonely, depressive, and distracted. According to Armstrong et al. (2000), heavy users (those who use the Internet more than four hours each day) have a tendency to escape their problems by spending time online. Reasons of time spent online could be associated with problematic Internet use. Therefore, the effect of the preference of the Internet use could be examined in future studies. The duration of the time people spend online is related to whether they have PIU or not. Someone with an Internet addiction or problems with Internet use is expected to use Internet longer than his/her counterparts with no problematic Internet use. This can be the cause or the result, or there might be a two way interaction between them. Future research should address that issue. On the other hand the activities the person engages in while online is also important. Future research should address to categorize heavy Internet users based on the type of online activities and examine the between group differences. Both Caplan (2002) and Davis (2001) pointed out that existent psychopathology is an underlying mechanism that predisposes people to develop maladaptive cognitions about Internet use. In order to see the effect of existent psychopathology on cognitions about Internet use, the effects of social anxiety dimensions (i.e. fear/anxiety and avoidance) were examined in the present study. Our second hypothesis (*H2*) was partially supported. The effect of the fear/anxiety dimension of social anxiety on cognitions about PIU was found to be significant. Consistent with findings of co morbidity between social anxiety and PIU (Shapira et al., 2000), the results revealed that individuals with higher fear/anxiety sub scores had higher scores on the OCS. These individuals use the Internet as a way of dealing with social fears (Shepherd & Edelmann, 2005) and satisfying social needs (Mckenna & Bargh, 2000). In other words, these individuals perceive the Internet as providing a "safe" environment in which to build social relationships (Mckenna & Bargh, 2000). Similarly, Papacharissi and Rubin (2000) mentioned that individuals who were less comfortable in face-to-face relationships used the Internet as a way of engaging in social interactions. It is interesting to note that the avoidance dimension of social anxiety did not have an effect on the OCS. However, in the literature, PIU is accepted as a distraction strategy to avoid (Davis et al., 2002) or escape from daily life problems (Meerkerk et al., 2010) such as relationship problems (Chou, Condron, & Belland, 2005). Therefore, the current results regarding avoidance did not concur with the related literature. This finding may be explained by the effects of other variables, such as those coping strategies. For instance, by playing a mediator's role, coping strategies may

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affect social avoidance and, hence, may indirectly influence PIU. To sum up, the results discussed above demonstrated that higher fear/anxiety scores were related to higher scores on the OCS, whereas higher scores on the social avoidance dimension were not.

Beyond the effects of some socio-demographic variables, romantic relationship status, time spent online and social anxiety, the effect of depression on OCS scores was also found to be significant. Therefore, our third hypothesis (*H3*) was supported and depression seems to be the most important variable in explaining cognitions about PIU. Individuals with higher depression scores had higher scores on the OCS, as expected by Caplan (2002) and Davis (2001) within the cognitive behavioral framework. Depression's co morbidity with PIU was noted previously (Morahan-Martin, 2005). Additionally, consistent with Kraut et al. (1998), there was a positive correlation between depression and PIU in the present study. Therefore, as Yang and Tung (2007) stated, depression may lead a person to develop maladaptive cognitions about PIU. Whereas a negative correlation was found between depression and PIU using this framework (Chou, 2001; Young & Rogers, 1998), a positive correlation was obtained in the present study. Therefore, as Caplan (2002) and Davis (2001) argued, existent psychopathology related to social anxiety and depression affects cognitions about PIU.

When considering the clinical implications of these findings, the present study may serve as a benefit for the professionals to deal with individuals with PIU. Being male, living with families and using the Internet for longer duration could be accepted as risk factors for PIU. Therefore, professionals should pay special attention to individuals having these characteristics in the therapeutic process. Besides, individuals with higher scores of fear/anxiety and depression should also be assessed regarding the/ PIU. Considering that PIU includes cognitive (Morahan-Martin & Schumacher, 2000; Young, 1999) as well as behavioral symptoms (Douglas et al., 2008; Kraut et al., 1998; Ozcan & Buzlu, 2007), mental health professionals should utilize both behavioral and cognitive techniques in the process of psychotherapy. Monitoring cognitions, and identifying the type of maladaptive cognitions can be used to deal with PIU (Young, 2007).

Based on the sample characteristics, factors related to PIU may be different. For example, whereas no effect of age was found in the present study due to its restricted age range, such an effect was found in another study conducted with a wider age range (Soule et al., 2003; Thatcher & Goolaam, 2005). Hence, the results of this study should be interpreted only in the context of university students. Further research using various samples, such as elderly, adults, and adolescents, is necessary to evaluate the divergent validity of the findings. In addition, the effects of some other variables on PIU should be taken into consideration in future studies, such as personality variables (neuroticism (Tsai et al., 2009), self-esteem (Yang & Tung, 2007; Douglas et al., 2008; Ko, Yen, Yen, Lin, & Yang, 2007), and conscientiousness (Durak & Senol-Durak, 2010), life satisfaction (Stepanikova, Nie, & He, 2010) and subjective well-being (Kraut et al., 1998). Factors determining time spent online should be considered in future studies as well. In the present study, the effect of time spent online on cognitions about PIU was found to be significant in all analyses. In summary, gender, time spent online, the fear/anxiety dimension of social anxiety and depression were significantly associated with cognitions related to PIU.

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