

Silvia Casale, Caterina Primi, Giulia Fioravanti

14 Generalized Problematic Internet Use Scale 2: update on the psychometric properties among Italian young adults.

Abstract. Problematic Internet Use (PIU) involves cognitive distortions and dysfunctional behaviors (e.g., compulsive Internet use or using the Internet to alleviate negative emotions) that lead to negative outcomes in various areas of an individual's life. The Generalized Problematic Internet Use Scale 2 (GPIUS2) is one of the few theory-driven instruments to measure the type of PIU associated with the unique communicative context available online. The purpose of this study was to expand upon previous empirical evidence of the psychometric properties of the GPIUS) among Italian young adults. The present psychometric evaluation of the Italian version of the GPIUS2 was conducted on a sample of 748 undergraduate students (48.3% males) from 18 to 26 years old ($M = 21.84$ years, $SD = 2.20$). With regard to scale dimensionality, the four first-order factors model (i.e. preference for online social interaction, mood regulation, deficient self-regulation, and negative outcomes) was confirmed (fit indices: Satorra-Bentler scaled $\chi^2/df = 3.03$; Comparative Fit Index = 0.93; Tucker–Lewis index = 0.92; Root Mean Square Error of Approximation = 0.05). Internal-consistency Cronbach's alpha ranged from 0.72 to 0.89. Convergent validity is demonstrated with significant correlations between GPIUS2 and Internet Addiction Test score. Validity was also assessed by exploring the relationship between GPIUS2 and several indices of psychosocial well-being that were expected to be related to PIU on the basis of previous studies. The overall results confirm previous evidence that the GPIUS2 is an adequate measure of generalized PIU cognitions, behaviors, and outcomes among young adults.

14.1 Defining Problematic Internet Use

The proliferation of Internet technology has led to an increase in problematic Internet use (PIU) in several cultural contexts (e.g., Canbaz, Sunter, Peksen, & Canbaz, 2009; Ghassemzadeh, Shahraray, & Moradi, 2008; Liu, Desai, Krishnan-Sarin, Cavallo, & Potenza, 2011). Even if cross-national variations in prevalence have been reported (Durkee et al., 2012), it seems possible to conclude that maladaptive internet use is widespread among adolescents. In Italy a recent study (Vilella et al., 2011) assessing the prevalence of behavioral addictions in an adolescent population found that 1.2% of the participants were addicted to the Internet. More recently, a prevalence of 5.01% was reported (Poli & Agrimi, 2012).



© 2016 Silvia Casale, Caterina Primi, Giulia Fioravanti

This work is licensed under the Creative Commons Attribution-NonCommercial-NoDerivs 3.0 License.

Brought to you by | Università degli Studi di Firenze

Authenticated

Download Date | 11/3/16 12:07 PM

Among the theoretical approaches to PIU, the cognitive-behavioral model (Davis, 2001) has received a great deal of attention. Compared to the Internet Addiction (IA) label, a misleading category in which to group all problems associated with excessive Internet use, the cognitive-behavioral model has the merit of accounting for what people are actually doing online. This perspective, rather than conceptualizing PIU as a behavioral addiction, conceptualizes PIU as a multidimensional syndrome that consists of cognitive, emotional, and behavioral symptoms that lead to difficulties in managing one's offline life. Davis (2001) proposes that PIU can be further classified as specific PIU (SPIU) – the overuse of content-specific functions of the Internet (e.g. gambling, viewing sexual material) – and generalized PIU (GPIU), which occurs when an individual develops problems due to the unique communicative context of the Internet. GPIU is conceptualized as “the real Internet syndrome,” as it would likely not even exist in the absence of the Internet, which acts, in its social role, as a means of communication. In fact, the interpersonal functions that are unique to the Internet have been consistently identified by a number of scholars as being associated with problematic, pathological, or addictive Internet use (Caplan & High, 2010; McKenna & Bargh, 1999; Morahan-Martin & Schumacher, 2000, 2003). In a review of the literature, Morahan-Martin (2007) explains that “there is a growing consensus that the unique social interactions made possible by the Internet play a major role in the development of Internet abuse” (p.335), adding that “people with problematic Internet abuse are drawn to the experience of being online, and prefer virtual rather than face-to-face interpersonal communication” (p.342). By drawing a distinction between GPIU and SPIU, Davis proposes an empirically testable answer to what it actually is that people are addicted to, which was neglected by the Internet addiction perspective.

14.2 The update model of Generalized Problematic Internet Use

Since the publication of Davis' research, Caplan (2002; 2003; 2005; 2007; 2010) has integrated the research on interpersonal communication in face-to-face (FtF) settings with Davis's model of GPIU by highlighting the role that interpersonal computer mediated communication (CMC) processes play in the relationship between Internet use and psychosocial well-being. In 2010 Caplan proposed an integrated conceptual model of GPIU that combines elements of Davis' cognitive-behavioral theory, his own works that address a preference for online social interaction (Caplan, 2003; 2005), and the socio-cognitive model of unregulated Internet use (Kim, LaRose & Peng, 2009; LaRose, Lin, & Eastin, 2003). The updated cognitive-behavioral model of PIU includes four core components: preference for online social interaction (POSI), mood regulation, deficient self-regulation, and negative outcomes (Caplan, 2010). POSI is defined as the belief that one is safer, more efficacious, and more confident with online interpersonal interactions than with FtF interactions. According to Caplan, POSI is a cognitive symptom of GPIU that may help explain, at least in part, why

certain individuals show other cognitive or behavioral indicators of problematic use, such as going online for mood regulation and having problems regulating their use of the web. Specifically, people with high levels of social anxiety and low levels of perceived social support have been found to be at risk of developing POSI (Caplan, 2007), since the online environment might be seen as more safer and comfortable than FtF interactions. The central role of POSI as a key factor for the development of other GPIU dimensions is one of the distinctive features of the GPIU perspective in comparison to the IA approach. Another cognitive symptom of GPIU is the motivation to use the Internet to alleviate distressing feelings (mood regulation), which has an important role in the development of the behavioral symptoms of both GPIU (Kim et al., 2009; LaRose et al., 2003) and POSI. Indeed, both the POSI and the mood regulation dimensions have been found to be good predictors of the failure to adequately monitor one's use of the web. The state in which conscious self-control of the web is diminished has been labeled as Deficient Regulation. This construct consists of a compulsive use dimension - the inability to control or regulate one's online behavior - and a cognitive preoccupation dimension, which describes an obsessive thought pattern about the online world. According to Caplan, "if cognitive symptoms of GPIU are salient enough, they lead to behavioral symptoms that ultimately result in negative outcomes" (p.1090). Several studies have provided preliminary empirical support for the basic assumptions of this model. Recent studies have produced empirical evidence supporting the claim that compulsive use is a central component of PIU (e.g., Caplan, 2005; Kim et al., 2009; van den Eijnden, Meerkerk, Vermulst, Spijkerman, & Engels, 2008). POSI has been found to be predictive of this compulsive use (Caplan, 2010; Fioravanti, Dèttore, & Casale, 2012) and mood regulation was a significant cognitive predictor of negative outcomes associated with Internet use (Caplan, 2002; Gámez-Guadix, Villa-George, & Calvete, 2012). Caplan and High (2007) found that the association between compulsive Internet use and negative outcomes is more pronounced when cognitive preoccupation is present. Moreover, results from the SEM analysis provided support for the overall conceptual model in several cultural contexts. Gámez-Guadix et al. (2012) found that preference for online social interaction and the use of the Internet for mood regulation increased the probability of reporting deficient self-regulation, which, in turn, was significantly associated with negative life outcomes.

14.3 The Generalized Problematic Internet Use Scale 2

Although some attempts to measure PIU have been made, these measures have not received extensive and systematic psychometric testing (Davis, Flett, & Besser, 2002). Recently, some theory-driven instruments have been created (e.g., Demetrovics, Szeredi, & Rözsa, 2008; Pratarelli & Browne, 2002). Among them, the Generalized Problematic Internet Use Scale 2 (GPIUS2; Caplan, 2010), a revised and updated

version of the 15-item Generalized Problematic Internet Use Scale (Caplan, 2002), has been developed in order to formally test the updated model of generalized problematic Internet use. The GPIUS2 addresses four core components: (1) POSI (a sample item is “Online social interaction is more comfortable for me than face-to-face interaction”); (2) Mood Regulation (a sample item is “I have used the Internet to make myself feel better when I was down”); (3) Deficient Self-Regulation, which consists of a compulsive use dimension and a cognitive preoccupation dimension (sample items are, respectively, “I find it difficult to control my Internet use” and “I think obsessively about going online when I am offline”); and (4) Negative Outcomes (e.g. “I have missed social engagements or activities because of my Internet use”).

The GPIUS2 features two new factors that were not included in the original version of the GPIUS: POSI and deficient self-regulation. In the new version, POSI is regarded as a single construct rather than as two separate factors (social benefits and social control). Indeed, Caplan (2003) demonstrates the value of combining the social benefits (the perceived social benefits of Internet use) and the social control factors (an individual’s perceived degree of control over self-presentation when interacting with others online) into a single subscale operationalizing POSI. Another change is that the GPIUS2 operationalizes deficient self-regulation as a higher-order factor that influences both cognitive preoccupation and compulsive Internet use subscale scores. This change is based on the work of LaRose and his colleague (2003), which suggests that compulsive Internet use and cognitive preoccupation are both symptoms of deficient self-regulation. In addition, the original scale’s excessive Internet use subscale was omitted from the new scale, as empirical evidence has emerged that frequency of Internet use is not necessarily indicative of problematic use (Caplan, 2005). Finally, the names of two of the original dimensions were revised. Specifically, the mood alteration factor was renamed “mood regulation” in order to emphasize the motivation to use the Internet to alleviate and process emotions (LaRose et al., 2003; Yates, Gregor, & Haviland, 2012), and the withdrawal dimension was renamed “cognitive preoccupation” in order to more clearly reflect its emphasis on obsessive thinking about the online world.

The GPIUS2 is one of the few theory-based measures of GPIU with good psychometric properties. In comparison to the Internet Addiction Test (IAT; Young, 1998), the most used instrument for assessing PIU, the GPIUS2 is specifically focused on problematic use that arises due to the unique communicative context of the Internet. For these reasons, both the first and the second version of the GPIUS have been used recently in a variety of contexts for the assessment of GPIU (e.g., Ang, Chong, Chye, & Huan, 2012; Casale & Fioravanti, 2011; Casale, Tella, & Fioravanti, 2013; Chittaro & Vianello, 2013; Fioravanti et al., 2012; Fioravanti, Primi, & Casale, 2013; Gámez-Guadix et al., 2012) with the aim of reporting the properties of the scale across various cultures. Among Mexican adolescents, the GPIUS2 has demonstrated adequate psychometric qualities, including construct validity, convergent validity, and internal consistency (Gámez-Guadix et al., 2012). The psychometric properties of

the Italian version of the GPIUS2 were examined in a previous study (Fioravanti et al., 2013). Dimensionality was assessed applying a confirmative approach. Two models were compared: a higher-order factor model, as defined by Caplan's confirmatory factor analysis (2010), and a four-factor model in which deficient self-regulation was not divided into two factors (compulsive use and cognitive preoccupation), since the high correlations found by Caplan suggested the presence of a unique factor containing both dimensions. Results show a poor overall fit for the hierarchical model and an acceptable fit for the four-factor model. With regard to convergent validity, significant correlations between GPIUS2 (total score and subscales scores) and the IAT were found. The overall findings suggested that the Italian version of the GPIUS2 is an adequate measure of cognitions, behaviors, and outcomes associated with problematic use of Internet communicative services. However, those results have to be regarded as preliminary, since the relationships between GPIUS2 dimension and indices of psychosocial difficulties associated with PIU (e.g., social support) were not investigated. Moreover, the study was only partially representative of undergraduates, since students were recruited in just two faculties from one university. Furthermore, descriptive statistics of the GPIUS2 subscales were not reported.

For these reasons, the aim of the present study is to expand upon previous empirical research, providing a larger and more representative sample of undergraduate students. Moreover, we intend to provide descriptive statistics for the GPIUS2 subscales and examine concurrent validity data through the use of measures of constructs correlated with PIU.

14.4 Methods

14.4.1 Participants and data collection

Seven hundred and forty-eight undergraduate students (48.3% males) ranging in age from 18 to 26 years old ($M = 21.84$ years, $SD = 2.20$) participated in the study. Students of several randomly selected faculties of the University of Florence, Perugia, and Arezzo (Italy) were recruited in the study rooms or approached at the end of the lectures by four female research assistants. Participants were verbally asked about their willingness in participating in a survey about Internet uses. They were informed that the time to complete the questionnaire was around twenty minutes. Participation was voluntary and anonymous. No formative credits or monetary rewards were given. Data collection consisted of written questionnaires administered individually in classroom settings. Informed consent was obtained from all participants.

14.4.2 Measures and Procedure

A socio-demographic questionnaire was administered to collect information about participants' age, gender, ethnic group, continent of residence, marital status, educational attainment, employment status, and annual income.

The GPIUS2 (Caplan, 2010) contains fifteen Likert-type items rated on an 8-point scale (from “definitely disagree” to “definitely agree”). Preliminary data (Fioravanti et al., 2013) show that the Italian version of the GPIUS2 seems to be a valid measure of GPIU cognitions, behaviors, and outcomes. Its psychometric properties are comparable with those seen in the original instrument (Caplan, 2010). Whereas Caplan identified five first-order subscales, two of which (i.e., compulsive use and cognitive preoccupation) constitute a second-order factor (deficient self-regulation), the best-fit measurement model for the Italian version of the GPIUS2 includes four first-order factors without any higher-order determinants. With regard to reliability, internal-consistency Cronbach's alpha ranged from 0.78 to 0.89 (Fioravanti et al., 2013).

The IAT (Young, 1998) is the most used measure of Internet dependence. The Italian version (Ferraro, Caci, D'Amico, & Di Blasi, 2007) contains twenty Likert-type items using a 5-point scale (from “not at all” to “always”), yielding a maximum score of 100. A sample item is “How often do you find that you stay online longer than you intended?” In the current study, the IAT shows good internal consistency (Cronbach's $\alpha = .89$).

In order to assess concurrent validity of the GPIUS2 a measure of the Big Five personality traits and a self-report for the assessment of social support were administered to a subsample of participants (N=465). The Big Five Inventory - Version 44 (BFI-44; John, Donahue, & Kentle, 1991) provides a score for each of the Big Five personality traits (Conscientiousness, Agreeableness, Emotional Stability, Extroversion and Intellect or Openness). The test is made up of 44 statements, each of which is rated on a 5-point Likert scale as to the subjects' degree of agreement with how well it describes them (from 1 = “strongly disagree” to 5 = “strongly agree”). Evidence for the Italian BFI-44 reliability, validity, and cross-cultural applicability was reported in Ubbiali, Chiorri, Hampton, & Donati (2013).

The Multidimensional Scale of Perceived Social Support (MSPSS, Zimet, Dahlem, Zimet, & Farley, 1988) is intended to measure the extent to which an individual perceives social support from three sources: Significant Others (SO), Family (FA), and Friends (FR). The MSPSS is a brief, easy to administer self-report questionnaire that contains twelve items rated on a seven-point Likert-type scale, with scores ranging from “very strongly disagree” (1) to “very strongly agree” (7). The Italian version of the MSPSS has proven to be psychometrically sound (Di Fabio & Busoni, 2008).

The measures were administered in this order in one session.

14.4.3 Data analysis

The four first-order factors model (Fioravanti et al., 2013) was tested by applying a confirmative approach. The Satorra-Bentler Scaled Chi-Square for continuous non-normal outcomes (Satorra & Bentler, 2001), conducted with Mplus 3.0 (Muthen & Muthen, 2004) and applying Maximum Likelihood Mean Adjusted Estimation, was used to conduct the Confirmative Factor Analysis (CFA). The criteria for assessing overall model fit were mainly based on practical fit measures: the ratio of chi square to its degree of freedom ($S-B\chi^2/df$), the Comparative Fit Index (CFI, Bentler, 1995), the Tucker-Lewis Index (TLI, Tucker & Lewis, 1973), and the Root Mean Square Error of Approximation (RMSEA, Steiger, 1990). For the ratio of chi square to its degree of freedom ($S-B\chi^2/df$), values less than 3 were considered to reflect fair fit (Kline, 2005). We considered CFI and TLI values of .90 and above to reflect fair fit (Bentler, 1995). For the RMSEA, values equal to or less than .08 were considered to reflect adequate fit (Browne & Cudeck, 1993).

Internal consistency for both the subscales and the total scale has been assessed by calculating the alpha coefficients. Finally, in order to test the GPIUS2 convergent validity, correlation analyses were conducted.

14.5 Results

Table 1 shows descriptive statistics for the GPIUS2 items. Univariate distributions of the 15 items were examined for assessment of normality. Skewness and Kurtosis indices of eleven items ranged outside the values of -1 and 1, suggesting that the departures from normality were not acceptable (Marcoulides & Hershberger, 1997). Descriptive statistics for GPIUS2 subscales and total score are reported in Table 2. The correlation coefficients for the GPIUS2 items are shown in Table 3.

Since the departures from normality were not acceptable, the Satorra-Bentler scaled chi-square ($S-B\chi^2$) for continuous non-normal outcomes was used. Results of the CFA showed a good overall fit for the four first-order factors model ($S-B\chi^2/df = 3.03$; CFI = .93; TLI = .92; RMSEA = .05). The path diagram and the standardized path coefficients are shown in Figure 1. Standardized factor loading ranged from .60 to .79, all of which were significant at the .001 level as well as the estimated correlations among errors.

Table 14.1. GPIUS2 Items Descriptive Statistics

Item wording	<i>M</i>	<i>SD</i>	Asymmetry	<i>SE</i>	Kurtosis	<i>SE</i>	Corrected Item Total correlation
1. <i>Online social interaction is more comfortable for me than face-to-face interaction.</i>	2.16	1.44	1.53	.09	2.41	.18	.45
2. <i>When I haven't been online for some time, I become preoccupied with the thought of going online.</i>	2.17	1.53	1.65	.09	2.49	.18	.58
3. <i>I prefer communicating with people online rather than face-to-face.</i>	1.62	1.13	2.77	.09	9.78	.18	.52
4. <i>I have used the Internet to make myself feel better when I was down.</i>	2.71	1.87	1.09	.09	.32	.18	.53
5. <i>I have used the Internet to talk with others when I was feeling isolated.</i>	2.73	1.93	1.11	.09	.35	.18	.51
6. <i>I have difficulty controlling the amount of time I spend online.</i>	2.72	1.92	1.14	.08	.44	.18	.62
7. <i>I have missed social engagements or activities because of my Internet use.</i>	1.51	1.17	3.15	.08	10.90	.18	.50
8. <i>I have used the Internet to make myself feel better when I've felt upset.</i>	2.29	1.72	1.51	.08	1.65	.18	.58
9. <i>I would feel lost if I was unable to go online.</i>	2.16	1.65	1.71	.08	2.48	.18	.57
10. <i>I find it difficult to control my Internet use.</i>	2.14	1.67	1.70	.08	2.30	.18	.63
11. <i>I think obsessively about going online when I am offline.</i>	1.45	.97	2.76	.08	8.64	.18	.63
12. <i>When offline, I have a hard time trying to resist the urge to go online.</i>	1.70	1.27	2.24	.08	5.15	.18	.65
13. <i>I prefer online social interaction over face-to-face communication.</i>	1.62	1.31	3	.08	9.81	.18	.43
14. <i>My Internet use has created problems for me in my life.</i>	1.47	1.06	3.15	.08	11.62	.18	.55
15. <i>My internet use has made it difficult for me to manage my life.</i>	1.48	1.09	3.20	.08	11.88	.18	.56

Table 14.2. GPIUS2 scales and total score: Descriptive Statistics

<i>GPIUS2 Scales</i>	<i>M (SD)</i>
POSI	1.79 (1.03)
MOOD REGULATION	2.57(1.55)
DEFICIENT SELF REGULATION	2.06(1.15)
NEGATIVE OUTCOME	1.48(.93)
GPIUS2 TOTAL SCORE	1.99 (.91)

Table 14.3. Correlation coefficients for the GPIUS2 items

	ITEM 1	ITEM 2	ITEM 3	ITEM 4	ITEM 5	ITEM 6	ITEM 7	ITEM 8	ITEM 9	ITEM 10	ITEM 11	ITEM 12	ITEM 13	ITEM 14	ITEM 15
ITEM 1	-														
ITEM 2	.43**	-													
ITEM 3	.53**	.31**	-												
ITEM 4	.29**	.35**	.32**	-											
ITEM 5	.35**	.36**	.31**	.57**	-										
ITEM 6	.25**	.45**	.28**	.31**	.34**	-									
ITEM 7	.15**	.24**	.26**	.20**	.19**	.38**	-								
ITEM 8	.27**	.35**	.29**	.61**	.53**	.35**	.31**	-							
ITEM 9	.25**	.45**	.31**	.30**	.34**	.38**	.38**	.34**	-						
ITEM 10	.19**	.41**	.26**	.24**	.23**	.74**	.44**	.31**	.46**	-					
ITEM 11	.25**	.50**	.41**	.24**	.21**	.42**	.48**	.29**	.51**	.49**	-				
ITEM 12	.29**	.47**	.33**	.31**	.26**	.51**	.36**	.33**	.44**	.58**	.63**	-			
ITEM 13	.39**	.20**	.46**	.24**	.21**	.20**	.29**	.26**	.23**	.23**	.34**	.32**	-		
ITEM 14	.20**	.28**	.28**	.25**	.19**	.37**	.46**	.31**	.32**	.46**	.46**	.45**	.31**	-	
ITEM 15	.17**	.27**	.30**	.24**	.21**	.41**	.48**	.31**	.31**	.50**	.46**	.47**	.31**	.71**	-

** p <.001

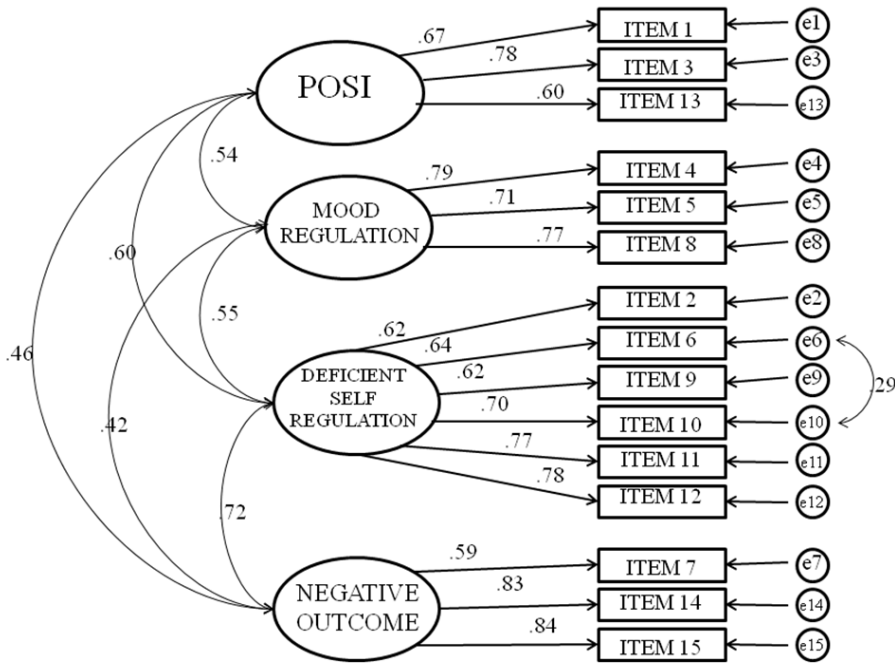


Figure 14.1. Confirmatory factor analysis of GPIUS 2

With regard to reliability, internal consistency Cronbach's Alpha was .71 (95% C.I.= .67 - .74) for POSI scale; $\alpha = .79$ (95% C.I. = .77 - .82) for Mood Regulation scale; $\alpha = .84$ (95% C.I. = .82 - .86) for Deficient Self-Regulation scale; and $\alpha = .78$ (95% C.I. = .75 - .81) for Negative Outcome scale. When all items are used together to create an overall GPIUS2 composite score, the scale's reliability estimate was .88 (95% C.I.= .87 - .89). That value did not increase when an item was deleted, and all item-corrected total correlations were above .30.

Concerning validity, correlations between the GPIUS2 scores, gender, age, online-time in a typical week, and the IAT score were computed. GPIUS2 total score and gender were poorly correlated ($r_{pb} = -.11$; $p < .01$). GPIUS2 total score and age were not significantly correlated ($r = .06$; $p = .07$). A moderate correlation was found between GPIUS2 total score and the time spent online in a typical week ($r = .25$; $p < .001$). All the correlations between GPIUS2 (total score and all the subscale scores) and IAT scores (Table 4) were positive, indicating that a higher level of generalized pathological Internet use was associated with a higher level of Internet dependence. The correlations can be considered high according to the recently proposed cut-off values for convergent validity (Muñiz, 2011).

Pearson correlation coefficients between GPIUS2, BFI, and MSPSS scores are shown in Table 5.

Table 14.4. Pearson correlation coefficients between GPIUS2 scores and IAT scores

<i>GPIUS2 Scales</i>	IAT total score
POSI	.37*
MOOD REGULATION	.48*
DEFICIENT SELF REGULATION	.71*
NEGATIVE OUTCOME	.60*
GPIUS2 TOTAL SCORE	.73*

*p < .001

Table 14.5. Pearson correlation coefficients between GPIUS2, BFI and MSPSS scores (n = 465)

	POSI	MR	DSR	NO	GPIUS2 TOTAL
BFI_EX	-.27**	-.14*	-.02	-.06	-.13*
BFI_AG	-.10*	-.04	-.06	-.12*	-.12*
BFI_CO	-.08	-.13*	-.18**	-.24**	-.18**
BFI_NE	.13*	.16*	.05	.02	.12*
BFI_OP	-.13*	.00	-.07	-.04	-.07
MSPSS_SO	-.24**	-.10*	-.26**	-.22**	-.20**
MSPSS_FA	-.17**	-.17**	-.19**	-.25**	-.22**
MSPSS_FR	-.24**	-.12*	-.17**	-.17**	-.19**
MSPSS-TOT	-.27**	-.16*	-.25**	-.26**	-.25**

Note BFI_EX= Extraversion, BFI_AG= Agreeableness, BFI_CO= Conscientiousness, BFI_NE= Neuroticism, BFI_OP= Openness, MSPSS_SO= support from Significant Others, MSPSS_FA= support from Family, MSPSS_FR= support from Friends, MSPSS-TOT= social support total score, POSI= Preference for Online Social Interaction, MR= Mood Regulation, DSR=Deficient Self-Regulation, NO=Negative Outcomes.

*p<.05 **p<.001

14.6 Discussion

The present chapter provides an update on previous findings (Fioravanti et al., 2013) regarding the psychometric properties of the GPIUS2 among young people. Such a scale merits further investigation since it has the benefit of covering different cognitive and behavioral dimensions of the type of Internet abuse associated with the unique environment available online. Based on the results of the present study, the Italian adaptation of the GPIUS2 was confirmed to be a valid measure of GPIU cognitions, behaviors, and outcomes, and its psychometric properties are comparable with those

seen in the original instrument (Caplan, 2010). In terms of scale dimensionality, Confirmatory Factor Analysis supported the four-scale structure, replicating our previous findings (Fioravanti et al., 2013). Indeed, a good overall fit for the four first-order factors model (POSI, mood regulation, deficient self-regulation, and negative outcomes) has been confirmed. From a theoretical point of view, this result confirms previous evidence regarding the strong interplay between obsessive thoughts about the Internet and compulsive Internet use, thus reflecting a unique manifestation of a diminished self-regulation capability. Concerning reliability, all four subscales and GPIUS2 total score demonstrated good to excellent internal consistency.

With regards to criterion validity, strong associations between GPIUS2 subscales and the IAT were found. In accordance with our previous findings, the higher correlation was found with the deficient self-regulation subscale, while the lower correlation was found with the subscale that measures preference for online social interaction levels. These results confirm that, in comparison with other measures of PIU, the GPIUS2 is more focused on problematic use due to the unique communicative context of the Internet. Since cognitive symptoms such as POSI have been systematically found to be a key factor in the development of negative outcomes (Caplan, 2003), a measure focused on these aspects might advance research about PIU. Indeed, the GPIUS2 provides a valuable approach to evaluating PIU from a multidimensional perspective, and a means of understanding the etiology and development of this problem.

The present findings are important because the relationship between GPIUS2 dimensions and indices of psychosocial difficulties associated with PIU (e.g., social support) was not investigated by previous researchers. The moderate negative associations between GPIUS2 (total score and all the subscales score) and a measure of social support demonstrated evidence for construct validity. Moreover, these significant negative associations might be seen as empirical support for the hypotheses put forth by the cognitive behavioral model of generalized PIU. According to Davis (2001), individuals with low levels of social support are more likely to appreciate an environment in which they feel safe and comfortable, which increases the likelihood that they will engage in inappropriate use of the Internet. Furthermore, the associations between Extraversion, Conscientiousness, and Neuroticism, on the one hand, and GPIUS2 dimensions, on the other hand, (respectively negative for Extraversion and Conscientiousness and positive for Neuroticism) support previous findings (e.g., Tsai, Cheng, Yeh, Shih, Chen, & Yang, 2009; van der Aa, Overbeek, Engels, Scholte, Meerkerk & Van den Eijnden, 2009) about the role of certain personality domains in the development of PIU. However, our results should not be seen as an empirical corroboration of previous findings, since they rely solely on cross-sectional data.

In conclusion, the present study builds on previous research on the psychometric properties of the GPIUS2, supporting its use among young, non-clinical populations. This scale permits researchers to evaluate different dimensions of PIU, is based on a well-developed theoretical model, and does not take much time to fill out. Moreover, the GPIUS2 addresses all the aspects that most researchers agree are related to PIU

beyond the different conceptualizations they adopt for PIU (Chittaro & Vianello, 2013). The implications for research mainly deal with the use of GPIUS2 to analyze the prevalence of PIU and its relationships with other variables. The utilization of the GPIUS2 in clinical settings as a means of screening people at risk to develop the “real” Internet syndrome is also useful. In cognitive-behavioral therapy settings, the GPIUS2 could also help identify the specific maladaptive cognitions and ruminative thoughts that maintain PIU.

The present study relied solely upon undergraduate students. Undergraduates are generally considered a risk population, since they typically have flexible schedules and a natural affinity towards the Internet (Kuss, Griffiths, & Binder, 2013). Moreover, in comparison with adolescent students that might have some parental control of the Internet, college students typically have free and unlimited access. For these reasons, our primary purpose was to explore the psychometric properties of the measure in this risky population. However, further research should try to determine if our results can be extended to adolescent students and young workers.

References

- Ang, R. P., Chong, W. H., Chye, S., & Huan, V. S. (2012). Loneliness and generalized problematic Internet use: Parents'perceived knowledge of adolescents'online activity as a moderator. *Computers in Human Behavior*, 28, 1342-1347.
- Bentler, P. M. (1995) EQS structural equations program manual. Encino, CA: Multivariate Software.
- Browne, M. W., & Cudeck, R. (1993) Alternative ways of assessing model fit. In Bollen K. A., Long J. S. (Eds), *Testing structural equation models* (pp. 136-162). Newbury Park, CA: Sage.
- Canbaz, S., Sunter, A. T., Peksen, Y., & Canbaz, M. A. (2009). Prevalence of the pathological Internet use in a sample of Turkish school adolescents. *Iran Journal of Public Health*, 38, 64-71.
- Caplan, S. E. (2002). Problematic Internet use and psychosocial well-being: Development of a theory-based cognitive-behavioral measure. *Computers in Human Behavior*, 18, 533-575.
- Caplan, S. E. (2003). Preference for online social interaction: A theory of problematic Internet use and psychosocial well-being. *Communication Research*, 30, 625-648.
- Caplan, S. E. (2005). A social skill account of problematic Internet use. *Journal of Communication*, 55, 721-736.
- Caplan, S. E. (2007). Relations among loneliness, social anxiety, and problematic Internet use. *Cyberpsychology & Behavior*, 10, 234-242.
- Caplan, S. E. (2010). Theory and measurement of generalized problematic Internet use: A two-step approach. *Computers in Human Behavior*, 25, 1089-1097.
- Caplan, S. E., & High, A. C. (2007). Beyond excessive use: The interaction between cognitive and behavioral symptoms of problematic Internet use. *Communication Research Reports*, 23, 265-271.
- Caplan, S. E., & High, A. (2010). Online social interaction, psychosocial well-being, and problematic internet use. In K. Young, & C.N. de Abreu, (Eds.), *Internet addiction handbook* (pp. 35-53). New York: John Wiley & Sons.
- Casale, S., & Fioravanti, G. (2011). Psychosocial correlates of internet use among Italian students. *International Journal of Psychology*, 46, 288-298.

- Casale, S., Tella, L., & Fioravanti, G. (2013). Preference for online social interactions among young people: Direct and indirect effects of emotional intelligence. *Personality and Individual Differences*, 54, 524-529.
- Chittaro, L., & Vianello, A. (2013). Time perspective as a predictor of problematic Internet use: A study of Facebook users. *Personality and Individual Differences*, 55, 989-993.
- Davis, R. A. (2001). A cognitive-behavioural model of pathological Internet use. *Computers in Human Behaviour*, 17, 187-195.
- Davis, R. A., Flett, G. L., & Besser A. (2002). Validation of a New Scale for Measuring Problematic Internet Use: Implications for Pre-employment Screening. *Cyberpsychology & Behavior*, 5, 331-345.
- Demetrovics, Z., Szeredi, B., & Rózsa, S. (2008). The three-factor model of Internet addiction: The development of the Problematic Internet Use Questionnaire. *Behavior Research Methods*, 40, 563-574.
- Di Fabio, A., & Busoni, L. (2008). Measuring perceived social support: psychometric properties of the Multidimensional Scale of Perceived Social Support (MSPSS) in a sample of university students. *Risorsa Uomo*, 14, 339-350.
- Durkee, T., Kaess, M., Carli, V., Parzer, P., Wasserman, C., Floderus, B., ... Wasserman, D. (2012). Prevalence of pathological internet use among adolescents in Europe: demographic and social factors. *Addiction*, 107, 2210-22.
- Ferraro, G., Caci, B., D'Amico, A., & Di Blasi, M. (2007). Internet Addiction Disorder: An Italian study. *Cyberpsychology & Behavior*, 10, 170-175.
- Fioravanti, G., Dèttore, D., & Casale, S. (2012). Adolescent internet addiction. Testing the association between self-esteem, the perception of Internet attributes and preference for online social interaction. *Cyberpsychology, Behavior, and Social Networking*, 15, 318-323.
- Fioravanti, G., Primi, C., & Casale, S. (2013). Psychometric evaluation of the Generalized Problematic Internet Use Scale 2 in an Italian sample. *Cyberpsychology, Behavior, and Social Networking*, 10, 761-766.
- Gàmez-Guadix, M., Villa-George, F., & Calvete, E. (2012). Measurement and analysis of the cognitive-behavioral model of generalized problematic Internet use among Mexican adolescents. *Journal of Adolescence*, 35, 1581-1591.
- Ghassemzadeh, L., Shahraray, M., & Moradi, A. (2008). Prevalence of internet addiction and comparison of internet addicts and non-addicts in Iranian high schools. *Cyberpsychology & Behavior*, 11, 731-733.
- John, O. P., Donahue, E. M., & Kentle, R. L. (1991). *The Big Five Inventory – Versions 4a and 54*. Berkeley, CA: Institute of Personality and Social Research.
- Kim, J., LaRose, R., & Peng, W. (2009). Loneliness as the cause and effect of problematic Internet use. The relationship between Internet use and psychological well-being. *Cyberpsychology & Behavior*, 12, 451-455.
- Kline, R. B. (2005) *Principles and Practice of Structural Equation Modeling (2nd Ed.)*. New York: Guilford Press.
- Kuss, D. J., Griffiths, M. D., & Binder, J. F. (2013). Internet addiction in students: Prevalence and risk factors. *Computers in Human Behavior*, 29, 959-966
- LaRose, R., Lin, C. A., & Eastin, M. S. (2003). Unregulated Internet usage: Addiction, habit, or deficient self-regulation? *Media Psychology*, 5, 225-253.
- Liu, T. C., Desai R. A., Krishnan-Sarin, S., Cavallo, D. A., & Potenza, M. N. (2011). Problematic Internet use and health in adolescence: data from a high school survey in Connecticut. *Journal of Clinical Psychiatry*, 72, 836-845.
- Marcoulides, G. A., & Hershberger, S. L. (1997) *Multivariate statistical methods. A first course*. Mahawa, NJ: Lawrence Erlbaum Associates.

- McKenna, K. Y., & Bargh, J. A. (1999). Causes and consequences of social interactions on the Internet: A conceptual framework. *Media Psychology*, 1, 249-269.
- Morahan-Martin, J. (2007). Internet use and abuse and psychological problems. In A. Joinson, K. McKenna, T. Postmes, & U.D. Reips (Eds.), *The Oxford Handbook of Internet Psychology* (pp 331-345). New York: Oxford University Press.
- Morahan-Martin, J., & Schumacher, P. (2000). Incidence and correlates of pathological Internet use among college students. *Computers in Human Behavior*, 16, 13–29.
- Morahan-Martin, J., & Schumacher, P. (2003). Loneliness and social uses of the Internet. *Computers in Human Behavior*, 19(6), 659-671.
- Muñiz, J. (2011, July). International strategies to improve tests and testing. Paper presented at the 12th European Congress of Psychology, Istanbul, Turkey.
- Muthen, L. K., & Muthen, B. O. (2004) Mplus 3.0 [Computer Software]. Los Angeles, CA: Muthen & Muthen.
- Poli, R., & Agrimi, E. (2012). Internet addiction disorder: Prevalence in an Italian student population. *Nordic Journal of Psychiatry*, 66, 55-9.
- Pratarelli, M. E., & Browne, B. L. (2002). Confirmatory factor analysis of Internet use and addiction. *CyberPsychology & Behavior*, 5, 53-64.
- Satorra, A., & Bentler, P. M. (2001). A scaled difference chi-square test statistic for moment structure analysis. *Psychometrika*, 66, 507-514.
- Steiger, J. H. (1990). Structural model evaluation and modification: An interval estimation approach. *Multivariate Behavioral Research*, 25, 173-180.
- Tsai, H. F., Cheng, S. H., Yeh, T. L., Shih, C. C., Chen, K. C., & Yang, Y. C. (2009). The risk factors of Internet addiction – A survey of university freshmen. *Psychiatry Research*, 167, 294–299.
- Tucker, L. R., & Lewis C. (1973). A reliability coefficient for maximum likelihood factor analysis. *Psychometrika*, 38, 1-10.
- Ubbiali, A., Chiorri, C., Hampton, P., & Donati, D. (2013). Psychometric properties of the Italian adaptation of the Big Five Inventory (BFI). *Bollettino di Psicologia Applicata*, 266, 37-48.
- van der Aa, N., Overbeek, G., Engels, R.C.M.E., Scholte, R.H.J., Meerkerk, G.-J., & Van den Eijnden, R.J.J.M. (2009). Daily and compulsive Internet use and well-being in adolescence: A diathesis-stress model based on Big Five personality traits. *Journal of Youth and Adolescence*, 38, 765–776.
- van den Eijnden, R. J. J. M., Meerkerk, G., Vermulst, A. A., Spijkerman, R., & Engels, R. C. M. E. (2008). Online communication, compulsive internet use, and psychosocial well-being among adolescents: A longitudinal study. *Developmental Psychology*, 44, 655–665.
- Villella, C., Martinotti, G., Di Nicola, M., Cassano, M., La Torre, G., Gliubizzi, M. D., ... Conte, G. (2011). Behavioral addictions in adolescents and young adults: Results from a prevalence study. *Journal of Gambling Studies*, 27, 203-14.
- Yates, T. M., Gregor, M. A., & Haviland, M. G. (2012). Child Maltreatment, alexithymia, and Problematic Internet Use in young adulthood. *Cyberpsychology, Behavior, and Social Networking*, 15, 219-225.
- Young, K. S. (1998) *Caught in the Net*. New York, NY: John Wiley
- Zimet, G. D., Dahlem, N. W., Zimet, S. G. & Farley, G. K. (1988). The Multidimensional Scale of Perceived Social Support. *Journal of Personality Assessment*, 52, 3