

Facing life problems through the Internet. The link between psychosocial malaise and problematic Internet use in an adolescent sample

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Abstract

Scholars have highlighted the role of negative affect as key correlates of Problematic Internet Use (PIU). According to the assumption that Internet-related behaviours can be seen as mechanisms to cope with everyday life (Kardefelt-Winther, 2017), the present study aims to explore the relation between PIU and psychosocial malaise, expecting that adolescents with high levels of social anxiety, negative emotions, and loneliness are more likely to be associated to the problem group of Internet users. Measures of PIU (GPIUS-2), social anxiety (IAS), negative affectivity (PANAS), and loneliness (ILS) were detected in a sample of 766 students attending Year 9–11 (13–19 years old; 47% females) of public high schools in the territory of Lecce (Apulia–Italy). A sub-group of problematic Internet users was identified ($n = 185$) and a control group was selected ($n = 187$). A logistic regression was applied to estimate the effect of psychosocial variables on the differentiation between problematic and control Internet users. Results of the present cross-sectional study show that a higher level of social anxiety, negative emotions, and loneliness increases the probability of belonging to the group of problematic Internet users. No significant differences between males and females were found in GPIU levels. The findings show that, for a better understanding of PIU onset and maintenance among adolescents, it is important, to take into account the life problems which may lead young people to overindulge in Internet use.

Keywords: technology use, problematic Internet use, adolescence, loneliness, social anxiety, affectivity

Résumé

Les scientifiques ont mis en lumière le rôle de l'affect négatif comme corrélat significatif de la dépendance. Partant de l'hypothèse que les comportements dans

Internet peuvent être vus comme des mécanismes d'adaptation à la vie quotidienne (Kardefelt-Winther, 2017), notre étude visait à explorer la relation entre la cyberdépendance et le malaise psychosocial. On s'attendait à ce que les adolescents affichant un degré élevé d'anxiété sociale, d'émotions négatives et de solitude fassent partie du groupe d'internautes à problème. Des indicateurs de la cyberdépendance (GPIUS-2), de l'anxiété sociale (IAS), de l'affect négatif (PANAS) et de la solitude (ILS) ont été relevés dans un échantillon de 766 élèves de la 9^e à la 11^e année (13 à 19 ans; 47 % de filles) choisi dans des écoles secondaires publiques du territoire de Lecce (Apulia, Italie). Un sous-groupe d'internautes cyberdépendants a été défini (n=185) et un groupe contrôle sélectionné (n=187). Un modèle de régression logistique a été appliqué en vue d'estimer l'effet des variables psychosociales sur la différenciation entre joueurs cyberdépendants et joueurs du groupe contrôle. Les résultats de l'étude transversale montrent qu'un degré plus élevé d'anxiété sociale, d'émotions négatives et de solitude augmentait la probabilité d'appartenir au groupe d'internautes cyberdépendants. Aucune différence notable n'a été constatée entre les hommes et les femmes quant au degré de cyberdépendance. Les résultats indiquent qu'une compréhension plus fine du développement de la cyberdépendance et de sa persistance chez les adolescents devra tenir compte des problèmes vécus dans leur vie personnelle qui les inciteraient à un usage excessif d'Internet.

Introduction

Since its advent, concerns have been raised about the negative outcomes associated to Internet use in the relational, scholastic, and work spheres (Beard & Wolf, 2001), such as family breakdown, disruption of close friendship, school failure, and job loss (Anderson, 2001; Cantelmi, Lambiase, & Sessa, 2004; Sherer, 1997; Young, 1998). People with problematic Internet use have been reported to enjoy high levels of depression (Ceyhan & Ceyhan, 2008; Ha et al., 2007; Young & Rogers, 1998), loneliness (Morahan-Martin & Schumacher, 2000; Odacı & Çelik, 2013; Yao & Zhong, 2014), anxiety (Kim & Davis, 2009; Tang et al., 2014), and to be at high risk of suicide (Kim et al., 2006; Lin et al., 2014).

The debate among researchers concerning Problematic Internet Use (PIU) conceptualization is far from over (Anderson, Steen, & Stavropoulos, 2017). On one side, a large number of studies follow the “addiction” perspective, consider PIU as an impulse-control disorder (Young, 1998), and focus on dysfunctions in executive control and in other executive functions as key correlates of both substance and behavioural addictions (Brand, Young, & Laier, 2014; Zhou, Zhou, & Zhu, 2016; Zhou, Zhu, Li, & Wang, 2014). On the other side, studies have also been published that stress the unique processes and factors involved in PIU, such as the widely used cognitive-behavioural model, which considers the role of dysfunctional cognitions about the self in relation to the online and offline world (Davis, 2001). For instance,

within this last perspective, Caplan (2003) suggests that PIU emerges from the preference for online interactions, which are perceived as safer and less threatening than face-to-face ones.

Beyond the identification of criteria for a PIU diagnosis, scholars are called on to explain why PIU occurs (Karddefelt-Winther, 2014, 2017). Actually, a large number of scientific research studies in this field are aimed to establish individual risk factors of PIU: for instance, personality traits such as impulsivity, low self-esteem, sensation seeking (Bozoglan, Demirer, & Sahin, 2013; Lee & Stapinski, 2012; Mehroof & Griffiths, 2010) are supposed to be relevant factors in determining subjects' behaviour when using Internet technologies, as well as psychopathological symptoms, such as depression and anxiety (e.g., Stavropoulos et al., 2017; Young, 1998). To date, the focus on individual characteristics is still prominent (Anderson et al., 2017), in line with the idea of an "ill" individual (i.e., addicted) with specific biologically-based traits and out of control (Reinarman, 2005; Venuleo & Marinaci, 2017). On the other hand, the need for more attention to the psychosocial factors which may play a role in the development of PIU is recognized (Caplan, 2002, 2003; Gackenbach, 1998; for a review, Fumero, Marrero, Voltes, & Penate, 2018). Previous studies have examined the role of contextual dimensions in the etiology of PIU, such as family environment in terms of child-parent communication, family expressiveness, affective involvement, and presence of parental conflicts (Cacioppo et al., 2019; Selaet al., 2020; Shi, Wang, & Zou, 2017; Wu et al., 2016a), as well as indicators of social connectedness, such as classroom climate (e.g., Stavropoulos et al., 2017; Stavropoulos, Kuss, Griffiths, & Motti-Stefanidi, 2016), perceived social support (e.g., Casale, Fioravanti, Flett, & Hewitt, 2014; Wu et al., 2016b) and loneliness (e.g., Caplan, 2006; Kim, LaRose, & Peng, 2009) (for a review, Fumero et al., 2018).

Certain empirical evidence has been offered regarding the importance of considering both individual and social dimensions. However, how such factors lead to PIU needs to be clarified on a theoretical plane.

Assuming the view of PIU as the by-product of a maladaptive process occurring between the individual and his or her context of belonging (Kleinman, Eisenberg, & Good, 2006; Venuleo & Marinaci, 2017), we argue the need to consider not only the negative extremity (Stavropoulos et al., 2016) of Internet use, but also the non-problematic side, to understand better how the underlying mechanisms of Internet use evolve from adaptive to maladaptive, and the behaviour moves from healthy to problematic.

Psychosocial malaise or well-being could be a key factor in differentiating problematic Internet users from the non-problematic ones, as already highlighted for problem gambling (Blaszczynski, 2000; Gupta, Derevensky, & Marget, 2004; Lynch, Maciejewski, & Potenza, 2004; Wood & Griffiths, 2007) and alcohol overuse (Gonzalez, Reynolds, & Skewes, 2011; Holahan, Moos, Holahan, Cronkite, & Randall, 2001). This perspective is consistent with the idea that Internet use can be understood as a self-medication strategy (Khantzian, 1997), that is a compensatory

response to the need to deal with psychological distress, including anxiety and depression (Robinson, Sareen, Cox, & Bolton, 2009; Suh, Ruffins, Robins, Albanese, & Khantzian, 2008; Zhao et al., 2017) which, in certain cases, may become dysfunctional. Also Davis (2001), in his etiological model regarding what he presented as “pathological Internet use,” postulates that PIU is the consequence of pre-existing psychological problems, such as depression, anxiety symptoms, and substance dependence, problems which increase the likelihood of developing problematic behaviours. Researchers following this model claim that people who suffer from social anxiety (Caplan, 2006; Lee & Stapinski, 2012), loneliness (Caplan, 2006; Kim et al., 2009), and other unsustainable states (Gámez-Guadix, 2014; Özdemir, Kuzucu, & Ak, 2014) are more likely to engage in online interactions for the possibility of either regulating or alleviating unpleasant states of mind in a “virtual” environment.

It can be noticed that the possibility of using the Internet as a way to handle life problems, as well as traumatic experiences (Schimmenti et al., 2017), can be a useful way to interpret also adolescents’ engagement in online behaviours. Indeed, the Internet and technology are recognized as increasingly important socialization agents for adolescents, allowing them to explore social identity, intimacy, and sexuality (Arnett, 1995; Israelashvili, Kim, & Bukobza, 2012; Karacic & Oreskovic, 2017; Korchmaros, Ybarra, & Mitchell, 2015; for a review, Valkenburg & Peter, 2011). For instance, in a recent study Boursier and colleagues (2020) have highlighted the role of social appearance anxiety in adolescents’ problematic social media use, considering the risky but rewarding opportunities underlying selfie-taking and selfie-sharing, one of the most common activities carried out online.

Using Internet may have compensatory functions for adolescents who maintain difficulties facing the challenges of this developmental stage: for instance, because of greater control over self-presentation and the lack of visual clues (Mehdizadeh, 2010; Peter, Valkenburg, & Schouten, 2007), it facilitates the involvement in social interactions for socially anxious adolescents, who are more sensitive to others’ feedback (Leigh & Clark, 2018). Nevertheless, while the Internet allows them to compensate for their (perceived) lack of social skills in offline contexts, on the other hand, it may lead socially anxious adolescents to prefer online social interactions, and to develop difficulties in self-regulating their online activity (e.g., they use the Internet compulsively). In this way, Internet use becomes problematic (Caplan, 2010). Similarly, using the Internet as self-medication or more generally as a mood regulation strategy when feeling sad, angry, hurt and so on, may become a maladaptive response when it causes self-regulation problems and harmful consequences (LaRose, Lin, & Eastin, 2003). On the other hand, adolescents do not constitute a homogeneous group; how they interpret their social identity and how face the challenges of their age can be thought as function also of the relational resources available to them to cope with the situation. Loneliness, thus, may be another key factor of psychosocial malaise. Adolescents who feel “left out” may accordingly go online to compensate for their lack of offline social relationships. In this case, it has been argued that the social benefits of online interactions may be

only apparent, because the Internet may promote online relationships at the expense of offline social networks, predisposing adolescents to a further exacerbation of relational impairment (Caplan, 2002, 2003; Valkenburg & Peter, 2009). In sum, Internet use for adolescents suffering from social anxiety, loneliness and other unpleasant emotions could represent a maladaptive way to compensate this negative affectivity. Accordingly, scholars are called on to investigate whether the presence of such psychological malaise influences individual differences in the likelihood of PIU onset.

Gender specificities should be considered. To date there are no univocal data, with certain studies finding a greater prevalence among boys (Dufour et al., 2016; Durkee et al., 2012), whereas elsewhere girls are higher in PIU (Casaló & Escario, 2019; Machimbarrena et al., 2019; for a review, Baloglu, Şahin, & Arpacı, 2020) or even no differences are found (Vigna-Taglianti et al., 2017; Wu et al., 2016b). At any rate, it has been claimed that the use of Internet as a way to handle life issues can be understood considering gender-based characteristics in the ways of using the net: for instance, in using the Internet girls may find an alternative way to talk about their feelings with others, since they are culturally expected to be more “expressive,” whereas boys may prefer online interactions as a compensative way to give vent to their emotions since they are expected to be more “physical” in face-to-face contexts (Gioia & Boursier, 2019; Yu et al., 2013; Yu, Kim, & Hay, 2013).

The present study: aims and hypothesis

The study aims to determine the capability of measures of psychosocial malaise—social anxiety, negative emotions, loneliness—to differentiate adolescents who manifest problematic Internet use from adolescents who do not. We expect that the former will show higher severity of psychosocial problems, compared to the latter. Specifically, it is hypothesized that problematic Internet users will be significantly more likely to be social anxious, lonely and high in negative emotions compared to non-problematic Internet users.

Furthermore, based on previous literature, the possible existence of gender related differences in the likelihood of manifest PIU was exploratory examined.

Method

Participants

The study was conducted in Lecce, a small city in Apulia (Southern Italy), with a total of 766 adolescents aged from 13 to 19 (mean age = 15.04 ± 1.154), among whom 46.9% were females and 33.3% effectively lived in the city. Participants attending Year 9 (52%) and 11 (48%) were recruited in public high schools. The socio-demographic characteristics of the sample, disaggregated for gender, are shown in Table 1.

Table 1
Socio-demographic characteristics of the whole sample

Sample characteristics	Male (%)	Female (%)	Total (%)	χ^2
Age				
13-15	232 (54.2)	196 (45.8)	428 (55.9)	.448
16-19	175 (51.8)	163 (48.2)	338 (44.1)	
Hometown				
City	154 (60.4)	101 (39.6)	255 (33.3)	8.089*
Small town	253 (49.5)	258 (50.5)	511 (66.7)	
Class				
Year 9	213 (53.5)	185 (46.5)	398 (52)	.049
Year 11	194 (52.7)	174 (47.3)	368 (48)	

* $p < .01$.

Instruments

Generalized Problematic Internet Use Scale – 2

The Generalized Problematic Internet Use Scale–2 (GPIUS–2; Caplan, 2010) is a self-report questionnaire used to measure level of Problematic Internet Use. It consists of 15 items associated to an 8-point Likert scale (from “Definitely disagree” to “Definitely agree”) and grouped in 4 subscales: Preference for Online Social Interaction, Mood Regulation, Deficient Self-Regulation, Negative Outcome. For the present study the total score was utilized, with a high average indicating a high level of problematic Internet use. In the study, the Italian version of the questionnaire (Casale, Primi, & Fioravanti, 2015; Cronbach α = from 0.72 to 0.89) was employed. In this study GPIUS–2 shows a good internal consistency (Cronbach α = .90).

Interaction Anxiousness Scale

The Interaction Anxiousness Scale (IAS; Leary, 1983) is a self-report questionnaire designed to estimate level of social anxiety. In particular, it measures feelings of anxiety in social experiences (e.g., face-to-face interaction) where people need others’ feedback. It is composed of 15 items associated to a 5-point Likert scale (from “Not at all characteristic of me” to “Extremely characteristic of me”). A high score on the IAS indicates a high level of social anxiety in interactional situations. In the present study, an Italian translation of the instrument was developed through a back-translation method. An adequate internal consistency (Cronbach α = .72) was found.

Positive and Negative Affect Schedule

The Positive and Negative Affect Schedule is a self-report questionnaire consisting of two subscales, corresponding to Positive (PA) and Negative Affect (NA), each of

them based on 10 items (PANAS; Watson, Clark, & Tellegen, 1988). The respondent assesses how much he or she identifies with the adjective given, responding on a 5-point Likert scale (from “Not at all” to “Very much”). Only the NA subscale was used, which refers to certain general unpleasant states such as anger, guilt and fear. A high score at the NA subscale indicates a high level of negative affect. For this study, the Italian version of PANAS (Terraciano, McCrae, & Costa, 2003; Cronbach $\alpha = .80$) was administered. The inter-items analysis was performed and a good internal consistency (Cronbach $\alpha = .82$) was found.

Italian Loneliness Scale

Subjective loneliness was measured using the General Loneliness Sub-scale from the Italian Loneliness Sub-scale (ILS; Zammuner, 2008; Cronbach $\alpha =$ from .80 to .88) which refers to the UCLA Loneliness Scale (Russell, Peplau, & Ferguson, 1978). ILS General Loneliness is composed of 7 items associated to a 4-point Likert scale (from “I often feel this way” to “I never feel this way”). A high score indicates a high level of subjective loneliness. Here the instrument shows good internal consistency (Cronbach $\alpha = .84$).

Procedures

The set of instruments used for data collection were administered on PCs using Google Forms after headmaster’s and parents’ authorizations. In each school, participants completed the questionnaires individually. According to the ethical code concerning the protection of personal data (Legislative Decree No. 101/2018), participants were informed about the general aim of the research and of the anonymity of responses. No incentive was given.

Data analysis

The data analysis was conducted in four steps using SPSS 22 software. Those steps were as follows.

First, GPIUS scores distribution on the whole sample was examined and an ANOVA was performed to compare male and female GPIUS score.

Second, Pearson’s correlations were computed to explore the relation between level of PIU and the target variables (i.e., social anxiety, negative affect, loneliness) on the whole sample.

Third, a subsample was extracted from the whole sample, to obtain two comparable groups, balanced for gender, age, class and hometown, of problem Internet users and healthy users. Since the GPIUS–2 currently does not present cut-off points for the detection of problematic use (Casale et al., 2015), the quartile distribution was considered to identify participants with a score falling in the lower end and in the higher one (see Table 2). Therefore, respondents scoring above the third quartile

Table 2

Scores of the whole sample on GPIUS-2 distributed by quartile and disaggregated for gender

Quartiles	<i>n</i> (%)	GPIUS score				<i>F</i>	<i>p</i>
		Min	Max	Mean	<i>SD</i>		
Q1 (<i>n</i> = 200)							
Male	113 (56.5)	1.00	1.87	1.48	.251	2.246	.136
Female	87 (43.5)			1.42	.276		
Q2 (<i>n</i> = 381)							
Male	197 (51.7)	1.93	3.67	2.71	.516	.226	.635
Female	194 (48.3)			2.73	.508		
Q3 (<i>n</i> = 185)							
Male	97 (52.4)	3.73	8.00	4.56	.793	.927	.337
Female	88 (47.6)			4.67	.801		
Total (<i>N</i> = 766)							
Male	497 (53.1)	1.00	8.00	2.812	1.235	.834	.361
Female	359 (46.9)	1.00	8.00	2.894	1.274		

Note: GPIUS-2 score is calculated by averaging the items.

value of the whole sample on GPIUS were selected as the problem group (PG), with 185 subjects being thus identified (mean age = 15.11 ± 1.20; female: 50.3%; Year 9: 49.7%). Then, 187 subjects were randomly selected from the 200 (26.1%) that scored below the first quartile as the control group (CG) (mean age = 15.01 ± 1.146; female: 49.7%; Year 9: 50.3%).

Finally, a logistic regression (Hosmer & Lemeshow, 2000) was applied to estimate the hypothesized effect of the variables of social anxiety, negative emotions, and loneliness on the differentiation between PG and CG. Membership of PG vs CG was then used as outcome variables and the respondents' total score on IAS, PANAS, ILS, as predictor variables.

Results

GPIU scores distribution

GPIU scores revealed a moderated skewed distribution (skewness value = .770, Kurtosis = .424). Participants' score distribution on GPIUS-2 by quartile and disaggregated for gender is reported in Table 2. No significant differences between males and females were found.

Correlations between GPIUS score and target variables

Pearson correlations between GPIUS-2 total score and IAS, PANAS, and ILS are reported in Table 3.

Table 3
Correlations between GPIUS-2 and IAS, PANAS, ILS

Measures	GPIUS-2	IAS	PANAS	ILS
GPIUS-2	1			
IAS	.266*	1		
PANAS	.317*	.405*	1	
ILS	.258*	.397*	.394*	1

Note: GPIUS-2 = Problematic internet use; IAS = Social anxiety; PANAS = Negative emotions; ILS = Loneliness.
* $p < .01$.

Table 3 shows statistically positive correlations between level of problematic Internet use and measures of psychosocial malaise. More specifically, high levels of PIU are associated with high levels of social anxiety ($r = .266$, $p < .01$), negative emotions ($r = .317$, $p < .01$), and loneliness ($r = .258$, $p < .01$).

Problematic Internet users vs Control

Scores distribution among the two subgroups in measures of psychosocial malaise (IAS, PANAS, ILS) are shown in Table 4.

The logistic regression analysis showed the significant effects of IAS ($\beta = .052$, $p < .05$), PANAS, ($\beta = .092$, $p < .001$) and ILS ($\beta = .121$, $p < .001$) in differentiating PG and CG group. The positive score of the beta value indicates that the higher the score on social anxiety, negative emotions and loneliness, the greater the probability of belonging to the PG (Table 5).

To evaluate the fitness of the model, we applied the Hosmer-Lemeshow. The test showed that the predicted values do not differ significantly compared to the observed values ($\chi^2 = 10.545$, $df = 8$, $p = .229$, 72.3% of cases classified correctly). Accordingly, the model can be considered reliable.

Discussion

The results provide support for the hypothesis that the presence of psychosocial problems is significantly associated with the presence of PIU among adolescents.

Table 4
IAS PANAS and ILS score distributions among PG and CG

Sample subgroups	IAS				PANAS				ILS			
	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD
PG ($n = 185$)	21	63	41.41	7.65	10	50	23.09	7.83	7	25	13.40	4.55
CG ($n = 187$)	19	58	36.17	6.10	10	41	17.16	5.83	7	21	10.50	2.93

Note: GPIUS-2 = Problematic internet use; IAS = Social anxiety; PANAS = Negative emotions; ILS = Loneliness.

Table 5

Regression coefficients (β) and relative statistics for social anxiety, negative emotions, loneliness

Measures	<i>B</i>	<i>S.E.</i>	Wald	<i>df</i>	Sig.	<i>Exp(B)</i>
IAS	.052	.018	8.726	1	.003	1.054
PANAS	.092	.020	21.929	1	.000	1.096
ILS	.121	.034	12.413	1	.000	1.129
Constant	-5.269	.726	52.704	1	.000	.005

Note: IAS = Social anxiety; PANAS = Negative emotions; ILS = Loneliness.

Logistic regression suggest that high levels of social anxiety, negative emotions, and loneliness are predictive of the subject belonging to the PG.

The findings are consistent with previous studies suggested that many adolescents turn to the Internet to manage unpleasant feelings, such as anxiety and loneliness, due their great difficulty in interacting and communicating with others in a healthy, positive, and meaningful way (Andreou & Svoli, 2013; Panicker & Sachdev, 2014). Accordingly, Internet use may represent a way to cope with difficult feelings and to compensate for the lack of resources in offline life, providing relief from psychological problems. Consistently with this general tenet, certain scholars have suggested that adolescents develop a propensity to use the Internet as a mood regulation strategy in a persistent, compulsive and rigid way (Caplan & Turner, 2007; Gámez-Guadix, Villa-George, & Calvete, 2012; Kim et al., 2009; Lee & Stapinski, 2012). Furthermore, for adolescents who feel incapable, uncomfortable and “left out” in their respective face-to-face social contexts—as the high levels of social anxiety and loneliness suggest—the Internet may provide the chance to control self-presentation, improve social skills and socialize (Harman, Hansen, Cochran, & Lindsey, 2005; Mehdizadeh, 2010; Schouten, 2007; Valkenburg & Peter, 2011) in an environment—that is, online social interactions—where they perceive themselves as “safer, more efficacious, more confident, and more comfortable” (Caplan, 2003, p. 629).

Accordingly, for adolescents suffering from psychological malaise, the effects of Internet use may be two-fold. On the one hand, it may be helpful to compensate for and cope with emotional and relational difficulties. On the other hand, while such adolescents try to compensate and cope with life problems through the Internet, they increase the likelihood of PIU. For instance, those who feel lonely and lacking significant relationships in their face-to-face contexts would prefer online social interactions at the expense of offline networks, and develop difficulties in controlling their involvement; consequently, they will show the largest impairment connected to Internet use (LaRose et al., 2003; Lee & Stapinski, 2012).

Analyzing the findings from the side of the non-problematic group, the study suggests that adolescents with a lower level of social anxiety, negative affects and loneliness enjoy less likelihood of using the Internet in a problematic way. It is

plausible that these risk or protective factors are related to each other: the feeling of being able to rely on others may be related to less social anxiety and more positive feeling, decreasing the need to indulge in Internet use as a way to coping with life's problems. Further studies are needed to clear the relationships among these risk factors. What seems important here is to emphasize that the psychosocial factors can act as protective factors against a compensative and problematic Internet use (Venuleo, Mossi, & Marinaci, 2017; Yen, Yen, Chen, Chen, & Ko, 2007b). Digital natives do not constitute a homogeneous group, with the same likelihood of being at risk of PIU and so more attention should be paid to how they perceive themselves in relation to their significant others and whether their inter-subjective life-world provides valid and efficacious support in facing the life challenges of their age-group. Research has extensively suggested the central role of everyday life problems in PIU onset and maintenance, suggesting that greater attention needs to be paid to the interweaving between the individual sphere and the relational one to understand the individual's positioning on the Internet use continuum from "normal" use to PIU, as pointed out in recent studies (e.g., Stavropoulos et al., 2016; Stavropoulos et al., 2017). Examination of the interplay between individual and contextual factors is consistent with the efforts made in the field of addiction research during the last 20 years to re-situate people in their social environment (Cheng & Li, 2014; Venuleo, Mossi, & Calogiuri, 2018). Recent perspectives on addictions regard them as a complex social process (Graham, Young, Valach, & Wood, 2008), one in which the context plays a key role in preventing or allowing negative outcomes. Indeed, it is possible to assume that the social environment may serve as a source of malaise and negative feeling (Borrell & Boulet, 2005; Marinaci, Venuleo, Buhagiar, Mossi, & Sammut, 2019; Venuleo, Rollo, Marinaci, & Calogiuri, 2016), increasing the need to indulge in Internet use as a way to escape from them, and to compensate for the lack of alternative resources in the "offline" context which could be useful in coping with life problems.

Accordingly, PIU determinants are not embedded in the "head" of the individual and do not develop in a social vacuum; rather, the social environment may serve as source of psychological distress. For instance, recent cultural studies have found that a critical image of the social environment, disparaging social ties and the rules of living together, are more likely to be associated to a maladaptive pattern of behaviour, including Internet over-use (Venuleo, Calogiuri, & Rollo, 2015a; Venuleo, Salvatore, & Mossi, 2015b; Venuleo et al., 2016), whereas a sense of social connectedness acts as a protective factor against harmful behaviours, including PIU (Li et al., 2013; Manton, Pennay & Savic, 2014). Accordingly, the relationship that adolescents maintain with the Internet may be seen as an expression of their way of interpreting the micro and macro social environment, which can protect from or boost the need to engage with the Internet as a way to escape from such feelings and situations that are believed to be unsustainable.

This study did not find any gender difference on Problematic Internet Use. Although the influence of gender on an individual's PIU levels was supported by several studies (Anderson et al., 2017), others did not confirm it (Gámez-Guadix, 2014;

Gámez-Guadix, Calvete, Orue, & Havas, 2015; Panicker & Sachdev, 2014; Vigna-Taglianti et al., 2017; Wu et al., 2016b). Gender differences and similarities in risk factors may explain the divergent results. For instance, previous studies found that depression is a risk factor for both genders, while hostility and lack of care by parents only for males (Yen et al., 2007b), and inter-parental conflicts and parental permission to use the Internet more than two hours per day only applies to females (Ko et al., 2015). Another complementary hypothesis is that differences would emerge in case of specific forms of PIU (Aparicio-Martínez et al., 2020; Victorin et al., 2020), whereas the present study addressed generalized PIU aside from the specific activities conducted online (Davis, 2001).

Conclusion

Our study supports the hypothesis that PIU occurs as a persistent and negative way to face life problems when adolescents do not enjoy or find or see alternatives for coping with them. As emerged from our findings, the more severe the psychosocial malaise (in terms of social anxiety, loneliness, and negative emotions), the higher is the likelihood of falling into the problematic Internet user group. On the opposite, the control group is related to higher well-being. Further studies are needed to explore the role of the micro and macro social environment's characteristics in reducing the impact of negative experiences and the need to use the Internet as a coping strategy: for instance, previous studies have suggested the role of positive family relationships (e.g., Appel, Holtz, Stiglbauer, & Batinic, 2012; van Den Eijnden, Spijkerman, Vermulst, van Rooij, & Engels, 2010; Venuleo, Mossi, & Rollo, 2019), social support (e.g., Wu et al., 2016b; Yeh, Ko, Wu, & Cheng, 2008), satisfaction with school and teachers (e.g., Jia et al., 2018, Wang et al., 2011; Yen, Ko, Yen, Wu, & Yang, 2007a). However, only a few studies have actually addressed PIU protective factors, and the prevalent focus is on negative psychological correlates of PIU.

A number of cautions and limitations attached to the findings of the present study should be considered. First, given the convenience nature of the sample, the results need to be related to the specific cultural context under analysis. Second, appropriate caution should be exercised in drawing causal inferences from data. We proposed an interpretation of the psychosocial dimensions both as risk factors towards PIU and as possible effects, but longitudinal studies or cohort surveys are required to clarify the nature of this interaction.

Finally, further research should aim to clearly identify and confirm cut-off points for the detection of PIU, to reach a “gold standard” measure which would make data on prevalence and both protective and risk factors comparable.

Despite these limitations, the findings discussed above deserve attention, for both their theoretical and clinical implications. At the theoretical level, various scholars have suggested that scientific research studies should aim to explain more clearly why people overindulge on the Internet even though they experience negative outcomes

(Billieux, Schimmenti, Khazaal, Maurage, & Heeren, 2015; Kardefelt-Winther et al., 2017); the present study provides a contribution to this goal, highlighting the importance of taking into account the life problems of adolescents which may lead them to overindulge in Internet use and predispose them to PIU, and supporting the idea that PIU can be interpreted as a maladaptive response to the need to compensate for and cope with psychosocial malaise. From a complementary point of view, the study highlights the potentially protective role of having supporting relationships. The adolescents of our sample who do not report suffering from loneliness are less likely to engage in PIU. As clinical implications, this finding suggests that preventing PIU among adolescents requires an in-depth consideration of the networks where they live, which may give conditions and instruments for facing life problems and using the Internet without taking any risks. Accordingly, a systemic intervention could consider adolescents and their proximal relational contexts.

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schools students. Informed consent was obtained from the parents, all of whom signed off before the students took part in the study.

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