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ORIGINAL ARTICLE

Insecure Attachment Attitudes in the Onset of Problematic Internet Use Among Late Adolescents

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Abstract Studies on the role played by attachment attitudes among late adolescents who show Problematic Internet Use (PIU) are still lacking. Three self-report measures concerning attachment attitudes, childhood experiences of abuse, and Internet addiction were administered to 310 students (49 % males) aged 18–19 attending the last year of high school. Students who screened positive for PIU were more likely to be male and to have suffered childhood experiences of physical and sexual abuse; they also scored higher than the other participants on scales assessing anxious and avoidant attachment attitudes. A logistic regression showed that the classification of participants in the PIU group was predicted by male gender, having suffered from physical and sexual abuse in childhood, and preoccupation with relationships. Keeping constant the effects of gender and childhood experiences of abuse in the equation model, increasing values of preoccupation with relationships were reflected by an exponential growth in the probability curve for PIU classification. Findings of the study support the hypothesis that insecure attachment attitudes (particularly the preoccupation with relationships) are involved in the development of PIU among late adolescents.

Keywords Problematic Internet Use · Attachment · Child abuse · Adolescence

Introduction

The official psychiatric taxonomy, as expressed through the diagnostic categories of the DSM-5 [1], recognises Internet Gaming Disorder as a condition that requires further study, describing it as a "persistent and recurrent use of the Internet to engage in games, often with other players, leading to significant impairment or distress" (p. 795). However, a growing body of psychological and psychiatric literature highlights the potential harmful effects caused by excessive use of several Internet services, including social networking, cybersex, online gambling, and online games [2]. This is reflected in the broader construct of Problematic Internet Use (PIU), which indicates a maladaptive preoccupation with using the Internet, experienced as an irresistible need to use it for periods of time longer than intended, compounded by significant distress or impairment resulting from the behaviour [3, 4]. PIU negatively impacts the individual's social and emotional functioning [5]. Research has linked PIU with psychological symptoms such as shyness [6, 7], social withdrawal [8], feelings of loneliness [9], anxiety [10, 11], mood disorders [12, 13], attention deficit [14], dissociation [15, 16] and so on. Among these variables, insecure attachment styles were identified as risk factors for PIU among adolescents and adults [16–18].

Attachment refers to the innate ability of humans to form bonds of affection and love toward significant others [19]. Attachment is an inborn motivational system that plays a significant role in every life stage: children need to maintain proximity with a caregiving figure in order to be protected from danger and threat, thus increasing their chances of survival. In adolescence and adulthood, the attachment system leads individuals to seek a safe retreat and a secure base from close and intimate relationships [20].

Classical depictions of attachment styles include three major classifications: secure attachment, anxious attachment and avoidant attachment [21]. Anxious and avoidant

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attachment are considered insecure forms of attachment. In fact, as adolescents and adults, individuals with anxious attachment show a high desire for intimacy, but their attachment attitudes and dispositions make them feel reluctant about becoming close to others because they worry that people will not reciprocate their feelings. On the other hand, those with avoidant attachment are lead by their attachment attitudes to feel discomfort in close relationships, to not invest in intimacy, and to be unable or unwilling to share feelings, thoughts and emotions with others. Instead, securely attached individuals tend to have high self-esteem and enjoy intimate relationships; they are also able to share feelings with other people and to seek social support when needed [22]. Some individuals who were exposed to severe abuse in childhood may even show disorganised or dual attachment, i.e. they could present the conflicting characteristics of both anxious and avoidant attachment, together with disturbing traumatic memories and inconsistent patterns of responses to attachment-related stimuli [22, 23].

There is some evidence suggesting that insecure attachment plays a relevant role in PIU [17, 18], and that attachment disorganisation is a key factor for understanding the most problematic cases of Internet addiction [16]. However, there is little research aimed at examining the specific role of different attachment attitudes among youth suffering from PIU.

In light of the aforementioned considerations, the purpose of this study was to examine the relationship between PIU and attachment attitudes in a sample of late adolescents. We hypothesised that PIU would be related to insecure attachment attitudes. In addition, consistent with previous findings showing significant associations between PIU and internalizing symptoms [6–13], it was speculated that among the attachment attitudes, those denoting an anxious attachment would show the strongest associations with PIU. We inferred that these associations would remain significant, even controlling for childhood trauma.

This type of research could be crucial for developing a lifespan model of PIU and for identifying specific risk factors that can contribute to the prevention and treatment of PIU. In particular, research on late adolescence is now acknowledged to be important for psychiatric research on developmental risk factors associated with disorders, since late adolescence can be a pivotal point at which to study how earlier adverse experiences can accumulate and increase disorder rates. In fact, individuals in this life stage are cognitively and emotionally capable of reporting their earlier traumatic experiences without the fear of reprisal or conflict of loyalty which may have been pertinent at the time of the experiences [24, 25].

Methods

Participants

The study involved 310 students (153 males, 49.4 %; 157 females, 50.6 %) aged 18–19 ($M = 18.37$, $SD = 0.49$) attending the last year of high school. They were recruited from six public high schools (each high school specialised in a different subject: science, teacher training, accountancy, tourism and hotel management, languages and industrial engineering) located in the city of Enna, a relatively small urban area (about 170,000 citizens) in the middle of Sicily (Italy).

Procedures

In order to investigate the relationship between PIU and attachment attitudes among the adolescents, we first contacted the head teachers of all the nine public high-schools in the city of Enna, and we described the objective of our study. Six of them agreed to collaborate and allowed the administration of questionnaires to their students. We randomly selected two classes from each school whose students were in their final year. This resulted in 321 eligible students who could complete the self-report measures. The students were informed about the nature of the study. Nine students were absent during administration, resulting in a sample of 312 participants. All the students gave their consent to participate in the research, and all but two completed entirely the self-report measures in their classrooms. The two participants who did not complete the measures were removed from the dataset, since in one case there were missing answers in more than 20 % of items on two measures and in the other case a measure was totally incomplete, thus resulting in 310 cases for data analyses. Data were collected between January 2012 and June 2012. This study was conducted in compliance with University Internal Review Board guidelines and in respect to the ethical norms of the Italian Psychological Association (AIP).

Measures

Internet Addiction Test (IAT) [26]. The IAT is a 20-item self-report measure for the screening of PIU and Internet Addiction. It assesses Internet usage in terms of the degree of preoccupation, inability to control use, extent of hiding or lying about online use, and continued online use despite negative consequences of behaviour. The IAT has demonstrated strong internal consistency and concurrent validity [27] and is one of the most widely used measures in Internet addiction research [28]. It includes questions such as, "How often do you fear that life without the

Internet would be boring, empty, and joyless?" The Cronbach's alpha reliability coefficient of the IAT in this research was 0.93.

Attachment Style Questionnaire (ASQ) [29]. The ASQ is a 40-item Likert type self-report measure, designed to measure five dimensions of attachment: Confidence (C; 8 items, e.g., "I feel confident that other people will be there for me when I need them"), Need for Approval (NfA; 7 items, e.g., "I wonder why people would want to be involved with me"), Preoccupation with Relationships (PwR; 8 items, e.g., "I often feel left out or alone"). Discomfort with Closeness (DwC; 10 items, e.g., "I prefer to depend on myself rather than other people"), and Relationships as Secondary (RaS; 7 items, e.g., "To ask for help is to admit that you're a failure"). The authors of the ASQ endorsed Hazan and Shaver's [30] and Bartholomew's [31] conceptualisations of attachment styles, therefore the five subscales of the measure can be intended as follows: C describes attitudes of trust and positive expectations from self and others, both core aspects of secure attachment; NfA reflects individuals' need for acceptance and confirmation from others and characterises Bartholomew's highly anxious individuals; PwR involves a dependent approach to relationships, a core feature of Hazan and Shaver's conceptualisation of anxious attachment; DwC is a central theme in Hazan and Shaver's conceptualization on the role of withdrawal in avoidant attachment; RaS is consistent with Bartholomew's concept of dismissive avoidant attachment. The ASQ is widely used in research with adolescents [32, 33], and the five scales of the ASQ have been shown to have adequate internal consistency and test–retest reliability [29, 34]. In the present study, Cronbach's alpha for the ASQ scales ranged from 0.76 (C) to 0.85 (DwC).

Traumatic Experiences Checklist (TEC) [35]. The TEC is a self-report measure addressing 29 types of potentially traumatic events, used in both clinical practice and research. The TEC has demonstrated strong convergent validity, being associated with alleged reports and official records of traumatic experiences [35, 36]. Different scores can be calculated on the TEC; in this research, only scores on childhood experiences of emotional abuse, physical abuse, and sexual abuse were calculated in order to obtain specific indices of these types of abuses. Specifically, the TEC key questions on the different types of abuse ("Did this happen to you?", followed by a description of the abuses) were considered valid only if they were consistent with the TEC control items on experiences of abuse; that is, only if participants answered consistently the two additional questions about details and contexts of abuses ("How many people did this to you?"; "Please describe your relationship with each person mentioned in your answer to the previous question"). With this criterion, we were able to use more reliable indices of emotional, physical, and sexual abuse in childhood on the basis of a subgroup of items related to the same domain.

Statistical Analysis

Descriptive statistics were computed for all the observed variables. The distribution of IAT scores was split at the 75th percentile (a method largely used in research for biomedical variables and clinical constructs, especially when the sample size is not overly large, as in our case, or when the distribution of a variable is not normal [37]) to empirically select a subsample of participants who were in the right tail of the IAT distribution and therefore at risk for PIU (PIU group). T test and Pearson's Chi square were performed in order to assess differences regarding attachment attitudes and childhood experiences of abuse between the PIU group and the other students. A hierarchical logistic regression was undertaken to examine the predictive associations between attachment attitudes, experiences of abuse in childhood, and the classification of participants into the PIU group. A p value of 0.05 was set as the critical level for statistical significance.

Results

Initially, the distributions of IAT and ASQ scales scores were verified to be normal: no significant skewness or kurtosis was detected. It was also confirmed that there was no significant association between gender and age in this sample ($t_{(308)} = 0.06$, $p = 0.95$).

When the distribution of IAT scores was split at the 75th percentile, IAT scores above 50 resulted in the last quartile of the distribution, a value consistent with other Italian studies on PIU with adolescents and adults [7, 16, 38–40]; therefore, the 78 students who scored above 50 on the IAT were identified as the group who was at risk for PIU (PIU group) in this sample.

The analysis of differences between groups showed that the participants in the PIU group did not differ from other students with respect to age, but they were more likely to be male. Also, significant differences were observed in the ASQ scores and experiences of abuse during childhood: specifically, students in the PIU group scored higher on the NfA, PwR and RaS scales of the ASQ, and they were more likely to report childhood experiences of physical and sexual abuse. Table 1 shows the descriptive statistics on the overall sample and differentiated by groups, with tests for differences between groups.

A hierarchical logistic regression analysis was then performed to examine whether the ASQ scores were able to predict the classification of participants into the PIU group,

Table 1 Descriptive statistics and differences between groups

	Overall (N = 310)		At-risk for PIU (N = 78)		Not at-risk for PIU (N = 232)		Statistics	
Scale level	M	(SD)	M	(SD)	M	(SD)	$t_{(308)}$	*p*
Age	18.37	(0.49)	18.29	(0.46)	18.40	(0.49)	1.74	0.083
Internet addiction test	42.14	(11.78)	58.15	(7.35)	36.75	(7.21)	22.57	<0.001
Confidence	32.14	(4.92)	32.28	(5.45)	32.09	(4.74)	0.29	0.772
Need for approval	19.19	(5.99)	21.04	(5.81)	18.56	(5.93)	3.20	0.002
Preoccupation with relationships	28.30	(6.37)	30.99	(5.80)	27.40	(6.31)	4.43	<0.001
Discomfort with closeness	35.98	(6.91)	36.97	(5.54)	35.65	(7.30)	1.47	0.142
Relationships as secondary	15.54	(6.06)	16.53	(4.74)	15.21	(5.13)	2.00	0.046
Nominal level	N	(%)	N	(%)	N	(%)	$\chi^2_{(1)}$	*p*
Gender (male)	153	(49.4)	48	(61.5)	105	(45.3)	6.19	0.013
Emotional abuse in childhood	89	(28.7)	29	(37.2)	60	(25.9)	3.65	0.056
Physical abuse in childhood	32	(10.3)	14	(17.9)	18	(7.8)	6.55	0.011
Sexual abuse in childhood	10	(3.2)	7	(9.0)	3	(1.3)	11.03	0.001

controlling for gender, age, and childhood trauma. The group membership (PIU vs. not PIU) was entered as the binary dependent variable. In the first step, gender and age were entered in the model as possible predictors; being male was a significant predictor of the participants' classification into the PIU group (OR = 1.94, $\text{Wald}_{(1)} = 6.09$, $p = 0.012$). In the second step, the experiences of abuse in childhood were entered in the model: sexual abuse added to the model (OR = 7.79, $\text{Wald}_{(1)} = 7.96$, $p = 0.003$), as did physical abuse (OR = 2.59, $\text{Wald}_{(1)} = 5.59$, $p = 0.018$), whereas emotional abuse did not result in being a significant predictor. Finally, the ASQ scales were entered, and among them only the PwR scale added to the model (see Table 2). Therefore, in this study the best fitting model for being classified into the PIU group included being male, having suffered from childhood experiences of physical and sexual abuse, and being highly preoccupied with relationships. This final model was significant (Omnibus test $\chi^2_{(10)} = 49.08$, $p < 0.001$; Hosmer and Lemeshow $\chi^2_{(8)} = 9.18$, $p = 0.33$) and it explained 18.8 % of Nagelkerke's pseudovariance, with 77.4 % goodness of fit.

Since one of the objectives of this study was to check for the possible unique contribution of attachment attitudes to PIU, we also plotted the estimated probability of being classified in the PIU group based on the participant's score on the PwR scale of the ASQ, controlling for the effects of the other predictors in the logistic regression (Fig. 1).

Figure 1 shows that the estimated probability of being classified as a problematic internet user in our sample significantly increased when higher scores on PwR were observed and the other significant predictors in the model (gender, physical abuse in childhood, sexual abuse in childhood) were controlled for. In fact, the estimated probability of being included in the PIU group increased about 75 % from the lowest to the highest inputed scores on the PwR scale.

Table 2 Logistic regression model for problematic internet use

	Exp(B)	$\text{Wald}_{(1)}$	*p*	95 % CI
Gender (male)	2.61	9.14	0.002	1.41–4.93
Age	0.62	2.43	0.12	0.34–1.13
Emotional abuse in childhood	1.11	0.10	0.76	0.59–2.07
Physical abuse in childhood	2.57	5.02	0.025	1.13–5.86
Sexual abuse in childhood	7.27	6.78	0.009	1.63–32.40
Confidence	1.06	2.60	0.11	0.98–1.14
Need for approval	1.01	0.20	0.66	0.96–1.08
Preoccupation with relationships	1.10	10.25	0.001	1.04–1.17
Discomfort with closeness	1.04	1.92	0.17	0.98–1.10
Relationships as secondary	1.01	0.14	0.70	0.95–1.08

Goodness of fit = 77.4 %

Discussion

This study aimed to assess the contributions of attachment attitudes on PIU among late adolescents. As expected for a nonclinical sample, participants showed IAT scores in the normal range. Indeed, when the distribution of IAT scores was split at the 75th percentile in order to select an empirical cut-off score for PIU in the sample, values above 50 were selected. This is consistent with previous research on the characteristics and psychometric properties of the

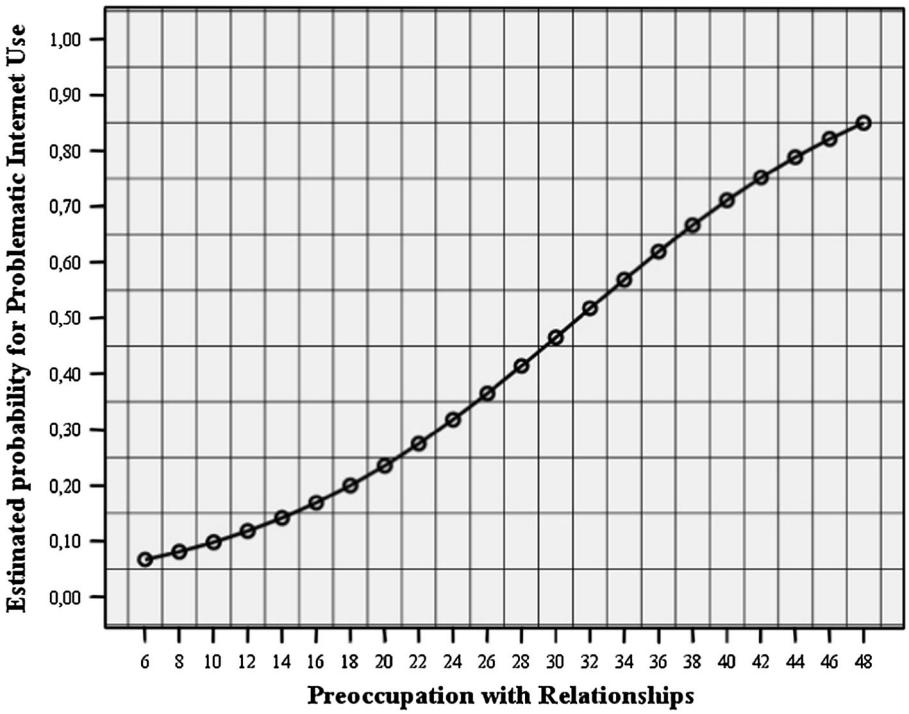

Fig. 1 Estimated probability for Problematic Internet Use based on preoccupation with relationships. *Note* preoccupation with relationships = PwR scale of the Attachment Style Questionnaire. The effects of gender and childhood experiences of physical and sexual abuse are kept constant in the equation

Italian translation of the IAT [7, 16, 38–40], further supporting the validity of this measure across different countries.

Among students who resulted at risk for PIU, there was a higher prevalence of males than females, consistent with a number of previous findings on children, adolescent and adult samples [41–45]. Students in the PIU group were more likely to have experienced physical and sexual abuse in their childhood. This result is consistent with research suggesting that childhood trauma can pose a risk to the onset of PIU and Internet addiction [16].

Students in the PIU group scored even higher in three of the four ASQ scales assessing insecure attachment attitudes. Specifically, they reported higher traits of attachment insecurity in the two ASQ anxious attachment scales (Need for Approval, which assesses excessive desires and efforts for acceptance and approval by other people; and Preoccupation with Relationships, which assesses the excessive degree of dependence on others for self-esteem and well-being) and even in an ASQ avoidant attachment scale (Relationships as Secondary, which assesses dismissive approaches to close relationships). Therefore, tests for differences between groups suggest that several aspects of attachment insecurity can be observed in late adolescents with PIU, mirroring the results of other studies with either college students [18] or adult participants [17].

However, when the ASQ attachment scores were hierarchically entered in a logistic regression for predicting the classification of the students in the PIU group or the other group, only the Preoccupation with Relationships scale added to the final model, which also included male gender and childhood experiences of physical and sexual abuse. Therefore, one of the ASQ scales assessing anxious attachment, the Need for Approval, did not contribute to the model as was expected, suggesting that a more relevant role in PIU is played by those anxious attachment attitudes related to preoccupation with relationships, and therefore to low autonomy, shyness and high dependence on other people [34, 46]. In fact, when controls for gender and childhood experiences of sexual and physical abuse were applied in the regression equation for estimating the probability of PIU classification, heightened Preoccupation with Relationships scores were reflected in an exponential growth of the probability curve: the probability of being classified in the PIU group ranged from less than 10 % for people with the lowest scores on Preoccupation with Relationships to more than 80 % when the highest scores on this scale were observed. Therefore, it is possible that some youth who are particularly preoccupied with relationships can use the Internet as a virtual retreat in order to protect themselves from feelings of loneliness, fears about real interactions and a sense of ineffectiveness in relationships [47]; or they could even consider the Internet a safe environment where they can try to interact with other people in order to develop a better sense of relatedness, competence and mastery, and therefore as a sort of self-therapy [46, 48].

The latter considerations can be linked to another remarkable finding of this study: strikingly, sexual abuse in childhood resulted in being the strongest predictor for the classification of the participants into the PIU group, with an

odds-ratio of more than 7, thus supporting the view that the most severe traumas in childhood predispose the victim to the onset of addictive behaviours, including Internet Addiction [16].

The present study has several limitations that need to be addressed. First, the information was collected by self-report measures, which suggests that the accuracy of individual reports cannot be guaranteed, although the measures of attachment styles, childhood experiences of abuse and Internet addiction used in this study have demonstrated strong psychometric properties. Further studies designed for testing the unique contribution of insecure attachment attitudes in PIU should include a multi-method assessment of both attachment styles and PIU. Second, evidence of a predictive association between the preoccupation with relationships and the risk for PIU does not allow one to conclude that a higher preoccupation with relationships leads individuals to develop PIU, even if statistical controls were applied. In fact, the cross-sectional design of this study cannot allow one to exclude that the predictive associations found in our study were affected by further factors that were not explored here (e.g., genetic factors, socioeconomic status, specific personality traits, and so on); longitudinal research is necessary to identify complex psychological pathways responsible for the development of PIU among youth. Finally, it is important to emphasize here a critical distinction between screening for PIU and a diagnosis of Internet addiction, which requires in-depth interviews and a deeper screening of adolescents' activities on the Internet. In fact, the IAT is a screening measure that does not allow one to look at the specific excessive uses of Internet services (e.g., social networking, online gambling, cybersex, file sharing, and online games). Future research should include a multi-measure assessment of PIU and details of the adolescents' specific usage of the Internet.

However, despite being an exploratory study, it may have relevant clinical implications. Indeed, our findings suggest that late adolescents with PIU are more likely to present indicators of preoccupation with relationships, which is an anxious attachment attitude. This attachment attitude entails a desire for close relationships but, at the same time, it comprises a worry that one is not worthy of love or affection, and that others will be unavailable or unsupportive [20, 25]. Therefore, clinicians working with youth suffering from PIU may wish to consider whether this attachment attitude somehow influenced the development of PIU. Likewise, they can positively use this knowledge for better addressing how the young patient copes with problems and feelings. This in turn can foster a therapeutic alliance and, at the same time, can help the patient reduce his or her need to use the Internet in a problematic way. Adolescents showing anxious attachment attitudes often struggle with being accepted and cared for during a time in which issues about identity increase, due to the transition from adolescence to emerging adulthood [49, 50]. Therefore, if these youth experience extreme failures in their relationships or in their social competencies, they could become more at risk for developing addictive behaviours such as alcohol addiction or Internet addiction [51, 52], especially if they have also experienced abuse and neglect in childhood that generated a template for severely insecure attachment attitudes [16]. For the above mentioned reasons, clinicians' efforts should also be directed at assisting adolescents who suffer from PIU in becoming more self-confident and less preoccupied with relationships; this will help the youth explore fears, anxieties and worries about their developmental tasks that might be expressed through PIU.

Summary

The construct of PIU describes a maladaptive preoccupation with Internet use and significant distress or impairment resulting from the behaviour. Presently there is little research which explores the relationship between PIU and attachment among adolescents. The aim of this study was to look at how insecure attachment attitudes contributed to the development of PIU among late adolescents. The results of the study showed that both avoidant and anxious attachment attitudes may play a significant role in the onset and continuation of PIU among late adolescents. In particular, among the attachment attitudes, preoccupation with relationships (an anxious attitude) resulted in being the most important risk factor for PIU in our sample even when other risk factors such as male gender and childhood trauma were taken into account. Further studies are necessary to verify the generalizability of these results in the adolescent population. However, the findings of this study may positively contribute to future research, prevention and clinical practice with adolescents suffering from PIU, offering new insights to aid in the efforts of researchers and clinicians in better understanding and addressing the psychological difficulties of youth suffering from PIU.

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