



Attachment and psychopathic traits in inpatient female and male adolescents

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ABSTRACT

Background: As high levels of psychopathic traits designate a severe group of antisocial individuals, there is an important need to find its correlates and intervention targets. In particular, there is a need to identify key dimensions of parent-child relationships that are related to psychopathic traits. The aim of the current study was to investigate relations between psychopathic traits and attachment to parents in female and male inpatient adolescents.

Method: A total of 122 male and 199 female adolescents aged 12–17 years were interviewed with the Child Attachment Interview. Parents and youths completed the Antisocial Process Screening Device.

Results: Results demonstrated that psychopathic traits - in particular callous-unemotional traits reported by parents - were related to dismissing attachment style to mother and father, to preoccupied attachment style to mother, and various attachment dimensions in male adolescents, but not in female adolescents.

Conclusions: Our results highlight the importance of gaining a better understanding of the gender-specific relations between callous-unemotional traits and attachment to mother and father in adolescence.

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1. Introduction

Research has consistently shown that high levels of psychopathic traits designate a severe, chronic and difficult-to-treat group of antisocial individuals [1,2]. Since psychopathy has devastating consequences for the individual as well as for society, it is crucial to determine its correlates and intervention targets. A number of studies extended the construct of psychopathy to children and adolescents in order to identify early signs of psychopathic traits at a time when personality structure is still developing and may be most susceptible to treatment [3]. Attachment theory, that provides an explanation of how the parent-child relationship emerges and influences personality development [4], may be helpful in gaining understanding of mechanisms underlying interpersonal, emotional and self-regulatory problems observed in individuals with psychopathic traits. However, previous studies on the links between psychopathic traits and attachment organization in children, adolescents and adults are characterized by several limitations and revealed mixed findings [5]. The aim of the current study was to investigate and clarify the associations between attachment organization and psychopathy dimensions in inpatient female and male adolescents.

1.1. Attachment and psychopathic traits

As an important characteristic of psychopathy is the inability to form and maintain strong relational bonds [6–8], scholars have sought to identify the causes of psychopathy in children's early relationships with caregivers [9,10]. The British psychiatrist John Bowlby proposed in his early works in 1944 [9] that children, who fail to bond or connect with their caregivers, are predisposed toward the development of "the affectionless psychopathy" characterized by low levels of empathy, caring behaviors, concern, or affection for other people and inability to feel remorse, guilt and shame. According to Attachment Theory, conceived by Bowlby [4] in his later works, the interactions of an infant with his/her primary caregivers establish a base for personality development. In a secure relationship with an attachment figure a child: (i) develops awareness and the ability to regulate his/her own emotions, responsiveness to emotional states of other people and the ability to build loving and trusting relationships [11] (ii) builds a positive, balanced, coherent and integrated self-concept characterized by a positive view of self, however also tolerance of own weaknesses [11,12] and (iii) masters self-regulatory abilities to delay gratification, resist immediate temptations and react to signals of punishment or non-reward [11]. These abilities are impaired in individuals with psychopathic traits and correspond to the (i) affective-interpersonal dimension of psychopathy characterized by callous-unemotional (CU) traits (e.g., shallow affect, lack of empathy and guilt) and narcissism - an arrogant and deceitful

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interpersonal style associated with a sense of entitlement and self-centeredness (ii) an impulsive and irresponsible behavioral style, characterized by low vulnerability to signals of punishment and frustrative nonreward [13].

When significant others are inconsistent or unresponsive to the child's needs, the child may form negative working models and may develop alternative, less effective strategies for affect regulation and processing of information [14]. A dismissing attachment style develops when an attachment figure fails to relieve distress and responds to child's needs with mild neglect, rejection or resentment. Consequently, the individual adopts deactivating strategies: avoidance of closeness, hyposensitivity to social interactions, self-reliance and denial of basic fears [11,12,15–17]. These strategies may contribute to development of psychopathic traits, in particular affective-interpersonal dimension of psychopathy, characterized by low levels of anxiety [18,19], lack of empathy and shallow affect [13].

A preoccupied attachment style emerges when the attachment figure is inconsistent, insufficient and unavailable to relieve distress and the child learns that s/he has to heighten the expression of negative emotions in an effort to elicit the expectable response of the caregiver [11,20]. Excessive focus on signals of potential attachment threats, characteristic for this attachment style, may inhibit the development of emotional, interpersonal and self-regulatory abilities and in effect lead to heightened levels of psychopathic traits. As preoccupied attachment style is characterized by an excessive focus on danger and threats, it could be related in particular to the impulsive and irresponsible dimension of psychopathy that has been previously shown to associate with heightened levels of anxiety [18,19].

Disorganized attachment style develops when a caregiver serves both as a source of fear and as a source of reassurance and this situation results in a lack of, or collapse of, consistent strategies for organizing responses in the stressful and threatening situations [21–24]. In such a case, the child struggles to develop empathy, a coherent self-concept and self-regulatory abilities and is at risk for development of interpersonal-affective (callous-unemotional traits and narcissism) and impulsive-irresponsible dimensions of psychopathy. Taken together, it is clear that each of the insecure attachment styles can be viewed as a risk factor for the development of psychopathic traits.

1.2. Previous research on attachment and psychopathic traits

Consistent with theoretical positions, several studies have demonstrated positive associations between psychopathic traits and attachment insecurity in adults [5,25–30]. In particular, most of the studies indicated positive relationships between impulsive/irresponsible component of psychopathy and attachment avoidance (characteristic for dismissing attachment style) and attachment anxiety (characteristic for preoccupied attachment style) [5,26–29].

Psychopathic traits were shown to be related to attachment insecurity not only in adults, but also in children [31] and youths [32–36]. However, research concerning relations between specific attachment types/dimensions and psychopathic traits in children and adolescents is limited and, similarly as in adults, revealed inconsistent findings. Patalich and colleagues [31] demonstrated a relation between CU traits and disorganized, but not dismissive attachment representations, in boys with disruptive disorders. In contrast, Catchpole's study [33] has shown that high levels of psychopathic traits are associated with: (i) dismissive attachment and low levels of attachment anxiety in adolescent boys (ii) low levels of dismissive attachment and high attachment anxiety (preoccupied attachment) in adolescent girls from forensic setting.

According to our knowledge Catchpole's study [33] is the only one that explored gender differences in relations between psychopathic traits and attachment in adolescents and only four studies examined this topic in adults [25,26,28,29]. Majority of these investigations

revealed that affective-interpersonal dimension of psychopathy is related to attachment avoidance in men [25,29,33], whereas various dimensions of psychopathic traits are associated with attachment anxiety in women [25,26,29,33]. However, links between psychopathic traits and attachment anxiety in men and attachment avoidance in women have not been clearly established in previous research. Since several studies have suggested psychopathy to be gendered [37–39], gender may be a determining factor in how the relationships between attachment and psychopathy play out. Thus, lack of investigation of gender differences in most of the previous studies on the relations between psychopathic traits and attachment is important limitation that may contribute to inconsistent findings.

The other limitation of many of the previous studies is use of only self-report measures of attachment [26–29,34] that are adequate, however they are not able to access internal representations of attachment that are outside conscious awareness and are more vulnerable to socially desirable responding than representational measures of attachment [40,41]. Moreover, to obtain comprehensive information concerning attachment organization in children and adolescents, it is particularly important to assess their attachment to both mother and father. However, only one study conducted by Flight and Forth [35], explored attachment to mother and father separately and revealed that psychopathic traits in adolescents are associated with attachment security only to father, but not to mother. This study was conducted in a forensic sample of incarcerated male adolescents and has not investigated unique attachment styles to mother and father. Thus, it remains unknown how various attachment types/dimensions in relationship to father and mother relate to psychopathy in general clinical samples. Outcomes of many studies indicate the importance of the relationship with fathers for many spheres of child development [14,41,42] in particular, positive relationships with fathers have been shown to be a better predictor than relationships with mothers for externalizing disorders and delinquent behaviors [42,43].

Finally, while conducting studies among children and adolescents it is important to obtain ratings of social, emotional, or behavior problems from different sources e.g., from parents, children, teachers [44]. However, relationships between attachment and psychopathic traits reported separately by multiple informants in children and adolescents have not been investigated in previous research.

1.3. Attachment and psychopathic traits in adolescence

Adolescence is a particularly important developmental period to study in relation to psychopathy because the attachment to parents plays an important role in development of personality not only in childhood, but also in adolescence, despite growing importance of attachment to peers and romantic partners in this period of life [45,46]. Teenagers can more easily deal with the challenges of adolescence (among others high emotional arousal, pressure of peer influences and struggles to achieve autonomy) in secure relationships with parents involving comfort, reassurance, and assistance in times of emotional distress [15,47,48]. Scott and colleagues [48] have shown that secure attachment to parents in the adolescent period is predictor of the overall adjustment independently of other qualities of the parent-adolescent relationship.

A better understanding of relations between psychopathic traits and attachment styles to both mother and father in adolescents is important for the identification of individuals that are at risk for the development of psychopathic traits and associated delinquent behaviors and the subsequent integration of therapeutic and preventive intervention into their care. As psychopathic traits are associated with high severity of psychopathological symptoms and are highly prevalent among adolescents from clinical settings [49], it is important to explore this topic not only in individuals from forensic settings and population-based samples, but also in youths from clinical samples.

1.4. Current study

Against this background, the aim of our study was to explore relationships between various attachment dimensions and attachment styles to mother and father and three dimensions of psychopathic traits (callous-unemotional traits, narcissism and impulsivity) assessed by multiple informants (parents and youths) separately in female and male adolescents. Attachment styles were measured by the Child Attachment Interview [40,41] that allows the distinction of four attachment styles (secure, dismissing, preoccupied and disorganized) as well as the dimensional assessment of attachment. We expected that girls and boys with low scores on the indices of attachment security in relationships to their mothers and fathers would be characterized by heightened levels of psychopathic traits. Moreover, based on previous studies, we predicted that male adolescents with disorganized and dismissing attachment style to both parents will be characterized by higher levels of psychopathic traits in comparison to adolescent boys with secure attachment style, whereas female adolescents with preoccupied attachment style to both parents will display higher levels of psychopathic traits in comparison to adolescent girls with secure attachment style. Finally, we investigated if depression severity may be a possible confounder in our analyses as almost half of our participants met criteria of major depressive disorder diagnosis and depressive symptoms may mimic some of the features of psychopathic traits such as shallow affect, negative view of others and aversive attitudes toward others.

2. Method

2.1. Participants

This study included a sample of 346 consecutive admissions of adolescents between 12 and 17 years of age to the adolescent unit of a private psychiatric hospital in a major metropolitan city in the Southwestern United States between October 2008 and June 2014. Consent and assent for study participation were obtained from both parents and adolescents. Inclusion criteria for study participation consisted of: (1) any adolescent patient between 12 and 17 years of age, and (2) sufficient fluency in English to complete all research. Exclusion criteria for study participation comprised the following: (1) diagnosis of schizophrenia or any psychotic disorder, and/or (2) diagnosis of mental retardation. Based on these criteria, 25 patients were excluded before participation in the assessment protocol. After these exclusions, a total of 122 boys and 199 girls were used in subsequent analysis.

At admission, the most common diagnoses (not mutually exclusive) in this sample (based on the structured interview) were: major depressive disorder (48.4%); obsessive compulsive disorder (26.1%), oppositional defiant disorder (22.6%), social phobia (23.1%), ADHD (23%), conduct disorder (20%), specific phobia (19.1%) generalized anxiety disorder (17%), panic disorder (15.6%) and separation anxiety disorder (13.4%). The racial breakdown was as follows: 88.1% White/Caucasian, 3.7% Asian, 1.7% Black, 0.3% American Indian, Alaskan or native, and 6.2% multiracial or other. Moreover, 77.20% of the adolescents' parents were married, 13.30% were divorced, 3.30% were separated, 3.10% were widowed parents and 1.10% were never married parents, 2% were living with someone as married. The sample was generally of high socioeconomic status.

2.2. Measures

2.2.1. The child attachment interview (CAI)

The Child Attachment Interview (CAI) [40,41] is an interview-based measure assessing attachment organization by accessing children's mental representations of their attachment figures. The CAI accomplishes this by asking children 17 questions concerning their self-representations and representations of each attachment figure

separately. For instance, the child is asked to choose three words to describe their relationship with each parent, in addition to being asked to describe what happens when each of the attachment figures is angry with him or her. The focus of the interview is also on conflict, illness, loss, abuse, and separation. The interview is conducted in private and videotaped. Interviews are coded from videotapes on 11 scales: emotional openness, balance of positive and negative reference to attachment figures, use of examples, preoccupied anger, idealization, dismissal, resolution of conflicts, and overall coherence. A score between 1 and 9 is assigned for each of the scales, based on a careful analysis of the narrative. Three of the scales—preoccupied anger, idealization, and dismissal—are rated separately for each attachment figure and they capture distinct, context-specific attachment strategies that may be different in each relationship. The other scales assess general capacity reflected in the whole interview narrative. Finally, the overall coherence scale is rated based on the ability to demonstrate consistency, cooperation, and openness in the interview as a whole. The coherence subscale integrates, to some degree information from other scales to determine overall interview quality, which most closely mirrors overall attachment security. All these subscales are used, together, to assign an overall attachment style classification from secure, preoccupied, and dismissing for each relationship identified in the interview (e.g., one for mother and one for father). The insecure disorganized style is assigned when the signs of disorganization (behaviors and discourse violations that are listed in the manual e.g., sudden switches of affect in response to loss, trauma, and/or frightening experiences, affect states that are irreconcilable or incompatible with the context and content of the description relayed) are noted. Previously, this measure has demonstrated adequate reliability and validity. Validity data for the CAI has been reported in adolescents demonstrating adequate interrater reliability (e.g., significant correlation between raters on coherence subscale), concurrent validity, and convergent validity for the CAI [41].

2.2.2. The antisocial process screening device (APSD)

The Antisocial Process Screening Device (APSD) [50,51], designed to detect psychopathic traits in youth, was completed by parents and youths. The instrument consists of 20 items each rated as 0 (not at all true), 1 (sometimes true) or 2 (definitely true), giving a total score ranging from 0 to 40. Factor analysis revealed three dimensions of this scale: a 7-item Narcissism dimension, a 5-item Impulsivity dimension, and a 6-item Callous-Unemotional dimension that could fit in both community and clinic-referred samples of children [52]. There is evidence of adequate validity, test-retest reliability and internal consistency for the APSD (e.g., [50,51,53,54]). The parent version of APSD was completed by one of the parents: either by mothers (for 83% of the participants) or by fathers (for 17% of the participants).

2.2.3. The computerized diagnostic interview schedule for children (C-DISC)

The C-DISC [55] is a structured computer-assisted diagnostic interview used to assess DSM-IV Axis I psychiatric disorders in children and adolescents. The interviews were administered in a private assessment room by doctoral psychology students or clinical research assistants. The interviewer is required to follow a series of computerized prompts; each one is read aloud and then the interviewer inputs a response based on each answer the interviewee provides. Positive diagnoses that met DSM-IV criteria in the past year were used to describe the sample. The number of major depressive disorder symptoms and the severity of impairment associated with major depressive disorder symptoms were included as an indicator of depression severity.

2.3. Procedure

This study was approved by the appropriate institutional review board. All adolescents admitted to an inpatient psychiatric unit were approached on the day of admission about participating in this study. Informed consent from the parents was collected first, and if granted,

assent from the adolescent was obtained in person. Adolescents were assessed by trained doctoral-level clinical psychology students, licensed clinicians, and/or trained clinical research assistants under the supervision of the last author. Interviews were videotaped, transcribed, and coded by certified coders. Assessments occurred within the first 2 weeks of admission. Order of assessment was random by nature of the scheduling constraints of the naturalistic setting.

2.3.1. Data analytic strategy

Partial correlations were performed to explore relationships between psychopathic traits and attachment dimensions in female and male adolescents controlling for depression severity. The level of significance for correlations ($p < 0.05$) was obtained after Bonferroni correction: $0.05/88 = 0.0005$. Multivariate Analysis of Covariance (MANCOVA) was conducted separately for female and male adolescents to investigate differences in levels of psychopathic traits between groups with various attachment styles to mothers and fathers including depression severity as covariate.

3. Results

Descriptive statistics for female and male adolescents are presented in Table 1. Our participants were characterized by lower levels of callous-unemotional traits, similar levels of narcissism and similar or even higher levels of impulsivity than youths from forensic samples and higher levels of all the psychopathic traits in comparison to adolescents from community samples [51,56,57].

First, we investigated the hypothesis that girls and boys with low scores on the indices of attachment security in relationships to their mothers and fathers would be characterized by heightened levels of psychopathic traits. This hypothesis was only partly confirmed. We found moderate significant correlations in the expected directions between callous-unemotional traits reported by parents and four attachment dimensions: rating of emotional openness, balance of description, resolution of conflict and overall coherence of narrative reported by parents in boys. However, narcissism and impulsivity reported by parents and self-reported psychopathic traits were not significantly correlated with attachment in male adolescents. In addition, none of the correlations between psychopathic traits and

attachment dimensions in female adolescents were statistically significant. (See Tables 2 and 3.)

Second, a multivariate analysis of covariance (MANCOVA) was performed to test the hypothesis that male adolescents with disorganized and dismissing attachment styles to mother and father will be characterized by higher levels of psychopathic traits in comparison to male adolescents with secure attachment style. The results of the MANCOVA showed that there were significant differences in psychopathic traits reported by parents between boys with various attachment styles to mother (Wilks $\Lambda = 0.827$, $F(12, 299.261) = 1.85$, $p = 0.04$; partial $\eta^2 = 0.061$) and between boys with various attachment styles to father (Wilks $\Lambda = 0.828$, $F(12, 299.261) = 1.841$, $p = 0.041$; partial $\eta^2 = 0.061$). Further analysis with post-hoc testing (using a Bonferroni correction) showed significant differences in callous-unemotional traits between male adolescents with various attachment styles to mother (Table 4) and to father (Table 5). Male adolescents with secure attachment style to mother showed lower level of callous-unemotional traits than those with preoccupied and dismissing attachment styles to mother, whereas male adolescents with secure attachment style to father showed lower level of callous-unemotional traits than those with dismissing attachment style to father. However, no significant differences in self-reported psychopathic traits between groups of boys with various attachment styles to mother (Wilks $\Lambda = 0.908$, $F(12, 312.490) = 0.970$, $p = 0.477$; partial $\eta^2 = 0.032$) and father (Wilks $\Lambda = 0.926$, $F(12, 312.49) = 0.770$, $p = 0.682$; partial $\eta^2 = 0.025$) were found.

Finally, we performed a multivariate analysis of covariance (MANCOVA) to test hypothesis that females with preoccupied attachment style to mother and father will be characterized by higher levels of psychopathic traits in comparison to female adolescents with secure attachment style. Female adolescents with various attachment styles to mother and father did not differ significantly in level of psychopathic traits reported by parents (attachment to mother: Wilks $\Lambda = 0.923$, $F(12, 502.984) = 1.294$, $p = 0.218$; partial $\eta^2 = 0.026$; attachment to father: Wilks $\Lambda = 0.923$, $F(12, 502.984) = 1.2$, $p = 0.218$; partial $\eta^2 = 0.026$) and self-reported psychopathic traits (attachment to mother: Wilks $\Lambda = 0.951$, $F(12, 518.859) = 0.833$, $p = 0.616$; partial $\eta^2 = 0.017$; attachment to father: Wilks $\Lambda = 0.960$, $F(12, 518.859) = 0.677$, $p = 0.775$; partial $\eta^2 = 0.014$).

4. Discussion

Our study is the first to explore relations between various attachment styles to mother and father and three dimensions of psychopathic traits (callous-unemotional traits, narcissism and impulsivity) separately in female and male adolescents. Investigation of these relations, taking into account attachment to both parents and gender differences, has important clinical implications for planning treatment and prevention of children and adolescents at risk for the development of psychopathic personality.

In general, our results indicate that only callous-unemotional traits observed by parents are related to attachment organization in boys after controlling depression severity, whereas none of the other dimensions of psychopathic traits reported by parents (impulsivity, narcissism) and none of the self-reported psychopathic traits are associated with attachment in boys. Moreover, self-reported and parent-reported psychopathic traits are not related to attachment organization in girls.

Specifically, callous-unemotional traits reported by parents are moderately correlated with four attachment dimensions: emotional openness, balance of description, resolution of conflict and overall coherence of narrative in male adolescents. These results suggest that boys with callous-unemotional traits could experience difficulties to develop and master various crucial emotional and social abilities in their attachment relationships with parents. In particular, they may show impairment in the ability to describe other people's feelings and to understand relations between affects, mental states and behaviors (emotional

Table 1
Descriptive statistics for female and male adolescents.

	Girls		Boys	
	M	SD	M	SD
Age in months	188.11	17.69	192.27	17.22
Total psychopathy (P) – t-score	66.87	13.11	64.08	12.27
Total psychopathy (P) – raw score	18.30	7.39	18.82	7.14
Callous-unemotional traits (P) – t-score	62.47	10.47	61.60	10.78
Callous-unemotional traits (P) – raw score	4.82	2.21	5.17	2.33
Narcissism (P) – t-score	60.38	12.36	56.84	12.09
Narcissism (P) – raw score	5.18	2.99	4.93	3.06
Impulsivity (P) – t-score	66.14	12.90	62.02	10.29
Impulsivity (P) – raw score	6.44	2.45	6.75	2.12
Total psychopathy (Y) – raw score	15.43	6.00	16.19	5.57
Callous-unemotional traits (Y) – raw score	3.60	2.12	4.10	2.10
Narcissism (Y) – raw score	4.42	2.64	4.93	3.06
Impulsivity (Y) – raw score	5.65	2.01	5.58	1.93
Emotional Openness	4.62	1.87	4.09	1.79
Balance of descriptions	4.15	1.90	4.07	1.76
Use of examples	4.67	1.68	4.38	1.69
Preoccup. anger with mom	2.99	2.41	2.21	2.16
Preoccup. anger with dad	2.55	2.28	2.60	2.38
Idealization with mom	2.48	2.01	2.38	2.01
Idealization with dad	2.62	2.09	2.26	1.96
Dismissal of mom	3.92	2.48	4.77	2.64
Dismissal of dad	4.61	2.62	5.22	2.64
Resolution of conflict	3.86	1.72	3.72	1.62
Coherence of narrative	4.25	1.97	4.05	1.71

P – parent, Y – youth.

Table 2

Partial correlations between attachment dimensions and psychopathic traits in boys controlling for depression severity.

	Total Psychopathy (P)	CU traits (P)	Impulsivity (P)	Narcissism (P)	Total Psychopathy (Y)	CU traits (Y)	Impulsivity (Y)	Narcissism (Y)
Emotional openness	−0.170	−0.297*	−0.134	−0.085	−0.061	−0.113	−0.045	−0.069
Balance of descriptions	−0.160	−0.312*	−0.099	−0.074	−0.110	−0.204	−0.004	−0.054
Use of examples	−0.144	−0.242	−0.131	−0.054	−0.088	−0.108	−0.053	−0.099
Preoccupied anger with mom	0.037	0.048	0.049	−0.007	0.020	0.140	−0.160	0.021
Preoccupied anger with dad	0.097	0.008	0.039	0.167	0.069	0.052	0.004	0.056
Idealization with mom	−0.045	−0.047	−0.081	0.038	−0.083	−0.118	0.032	−0.103
Idealization with dad	−0.026	0.064	0.015	−0.099	−0.054	0.005	−0.067	−0.055
Dismissal of mom	0.196	0.248	0.087	0.154	0.083	0.083	0.013	0.096
Dismissal of dad	0.227	0.286	0.166	0.136	0.156	0.157	0.117	0.070
Resolution of conflict	−0.165	−0.302*	−0.137	−0.069	−0.121	−0.209	−0.094	−0.005
Overall coherence of the narrative	−0.211	−0.323*	−0.173	−0.127	−0.077	−0.099	−0.037	−0.086

P – parent, Y – youth.

The level of significance ($p < 0.05$) was obtained after Bonferroni corrections ($0.05/88 = 0.0005$).* $p < 0.05$.

openness) as well as to build a coherent, integrated, and balanced concept of other people by noticing both positive and negative characteristics (balance of description). They appear also to struggle in properly developing self-conscious feelings such as guilt, shame and remorse that play an important role in the resolution of conflicts [58]. Finally, they are impaired in the ability to produce coherent and elaborate attachment-relevant narratives (low coherence of narrative).

Moreover, boys with dismissing and preoccupied attachment styles in relation to mothers and dismissing attachment style in relation to fathers are characterized by higher levels of callous-unemotional traits reported by parents in comparison to boys with secure attachment style. It has been suggested that individuals characterized by a dismissing attachment style are afraid of failure or punishment in the reaction to their needs and proximity-seeking attempts [11,20]. Thus, they use deactivating strategies that minimize the experience of rejection and punishment and protect them against threats to self-image; in particular, avoidance of closeness, hyposensitivity to social interactions, self-reliance, denial of basic fears and lack of cognitive accessibility to negative self-representations, distressing thoughts and memories [11,12,15–17]. Their limited access and awareness of their own emotions and those of other people may be one of the factors that contribute to lack of empathy, deficient affect and disregard for other people – key characteristics of callous-unemotional traits (and psychopathy).

Since callous-unemotional traits have been shown to associate with low levels of anxiety [18,19], whereas preoccupied attachment style is associated with a heightened focus on attachment-related threats, it seems surprising that boys with preoccupied attachment style to mother were characterized by high levels of CU traits in the present study. However, a study conducted by Savard and colleagues [29] revealed similar findings to ours: attachment anxiety was found to be positively related to the affective-interpersonal dimension of psychopathy in men.

Perhaps excessive focus on signals of potential attachment threats in individuals with a preoccupied attachment style may inhibit an awareness and the ability to regulate own emotional states, sharing and understanding emotions of other people, and the establishment of trusting relationships, resulting in heightened levels of callous-unemotional traits. Fears of being abandoned and the history of disappointing interactions with attachment figures could lead to engagement in activities aimed at demanding attention and care, thereby leading to unemphatic approaches to others' feelings and needs.

Surprisingly, male adolescents with disorganized attachment style did not differ significantly from other groups in their levels of psychopathic traits. Previous studies revealed that a high proportion of violent offenders with psychopathic traits are characterized by a disorganized attachment style [10,30,59]. Perhaps disorganized attachment style is characteristic of individuals from forensic settings who commit violent and antisocial acts rather than for adolescents from clinical or population samples who display psychopathic traits. It should be kept in mind, however that the group size of male adolescents with disorganized attachment style was small ($n = 19$) in the current study, which may have led to reduced power to detect significant difference.

Contrary to predictions, only psychopathic traits reported by parents, but not self-reported psychopathic traits, were related to attachment organization in boys. It could be that self-report of psychopathic traits is less accurate than parent report. Although results of the self-report APSD have been shown to correlate significantly with other measures of antisocial behaviors, it is characterized by much lower internal consistency in comparison to parent report [51]. Moreover, it is worth noting that adolescents rated their psychopathic traits at lower levels than their parents. Since the importance of peers and need for social acceptance increases during adolescence [60], youth may under-report levels of psychopathic traits that are socially undesirable. Such a social

Table 3

Partial correlations between attachment dimensions and psychopathic traits in girls controlling for depression severity.

	Total Psychopathy (P)	CU traits (P)	Impulsivity (P)	Narcissism (P)	Total Psychopathy (Y)	CU traits (Y)	Impulsivity (Y)	Narcissism (Y)
Emotional openness	−0.125	−0.109	−0.166	−0.094	−0.143	−0.083	−0.144	−0.122
Balance of descriptions	−0.160	−0.130	−0.181	−0.138	−0.106	−0.100	−0.136	−0.031
Use of examples	−0.157	−0.123	−0.168	−0.161	−0.173	−0.135	−0.153	−0.115
Preoccupied anger with mom	0.169	0.176	0.137	0.132	0.041	−0.028	0.146	−0.047
Preoccupied anger with dad	0.127	0.071	0.134	0.166	0.014	−0.011	0.110	−0.076
Idealization with mom	−0.128	−0.100	−0.069	−0.130	−0.070	−0.032	−0.122	0.014
Idealization with dad	−0.009	0.024	−0.009	−0.029	0.004	−0.013	−0.060	0.098
Dismissal of mom	0.180	0.110	0.140	0.210	0.206	0.103	0.116	0.218
Dismissal of dad	0.127	0.087	0.100	0.144	0.144	0.095	0.148	0.063
Resolution of conflict	−0.211	−0.120	−0.179	−0.241	−0.165	−0.100	−0.187	−0.098
Overall Coherence of the narrative	−0.133	−0.084	−0.149	−0.150	−0.136	−0.086	−0.134	−0.122

P – parent, Y – youth.

None of the correlations was significant at the level $p < 0.05$ obtained after Bonferroni corrections ($0.05/88 = 0.0005$).

Table 4
Differences in psychopathic traits between boys with secure and insecure attachment styles to mother.

	Secure attachment style(S) (n = 28)	Dismissing attachment style(Ds) (n = 61)	Preoccupied attachment style(P) (n = 14)	Disorganized attachment style(Dr) (n = 19)	F value	p	partial η^2	Bonnefroni post hoc test
	M(SD)	M(SD)	M(SD)	M(SD)				
Total psychopathy (P)	60.46 (12.25)	65.30 (11.77)	65.57 (15.08)	64.58 (2.82)	0.843	0.52	0.03	
CU traits (P)	55.71 (9.74)	63.25 (10.01)	65.00 (13.81)	62.47 (9.73)	2.86	0.02	0.11	S < Ds & P
Impulsivity (P)	59.61 (9.27)	62.15 (10.80)	63.86 (9.81)	63.79 (10.50)	0.74	0.59	0.03	
Narcissism (P)	55.36 (12.14)	57.75 (11.40)	55.71 (14.41)	56.89 (12.09)	0.26	0.93	0.01	

P – parent.

desirability bias could attenuate correlations between self-reported psychopathic scores and attachment. On the other hand, it could be that parents of children with whom they do not have a secure, warm relationship are not aware of internal states experienced by their sons and in effect perceive them as more callous and unemotional. In addition processes of achieving autonomy and independence from parents that take place in adolescence [61] could deepen distance between parents and their children and result in the perception of low level of empathy and affection in their sons by caregivers. Thus, it would be helpful to include also other informants of callous-unemotional traits in future studies such as teachers and peers.

In contrast to the above findings for male adolescents, female adolescents with various attachment styles were found not to differ in levels of psychopathic traits and all the correlations between attachment dimensions and psychopathic traits in girls were insignificant. These findings are consistent with studies which demonstrate that some of the correlates of psychopathic traits (in particular callous-unemotional traits) in male individuals do not consistently generalize to female samples and that different etiological factors may underlie psychopathic traits in women and men [37,39,62]. Some authors suggest that since the expression of psychopathic traits could be different in girls than in boys and current measures tend to be biased toward male-typical expression of psychopathic traits, separate methods of assessment of these features should be constructed for female populations [38,63].

Summing up, our results show that attachment relationships to mother and father may be one of the factors that associate with callous-unemotional traits in boys. However, findings did not suggest an overwhelmingly strong association, and may point to moderators that may attenuate the strength of the association for some boys. Here, genetic factors [64] or parenting skills may play a role [65] and should be the focus of future work.

There are several limitations to the current study. First, participants of the study were patients of a private psychiatric hospital. Conducting a study in this specific sample allowed us to assess relatively large

sample of male and female adolescents with various insecure attachment styles and higher proportion of children with higher severity of psychopathic traits, in opposite to population sample. However, we cannot generalize our findings to other adolescent populations including forensic samples, community and inpatient samples from diverse backgrounds. Moreover, the vast majority of the participants were Caucasian adolescents from well-educated and financially stable environments. Another limitation is that parents (mostly mothers), who are involved in the attachment relationship with their child, were one of the informant of psychopathic traits. This involvement could influence their reports of psychopathic traits of their children. Moreover, no conclusions on cause-effect relations can be drawn based on our results. Finally, sample sizes of groups of male and female adolescents with various attachment styles were small.

Despite these limitations, the current study provides important clinical and research implications. Firstly, our findings suggest that it could be beneficial for male individuals with callous-unemotional traits or at risk for development of these traits to develop relational and empathic abilities in warm, accepting and empathic relationships in individual, group, family or parent-child relationship therapy. Several studies provide initial support to these assumptions [66,67]. It would be valuable to further investigate the effectiveness of such therapeutic or preventive interventions in adolescents. Moreover, it would be beneficial to replicate our findings in various samples: community and inpatient samples as well as forensic samples of adolescents. It is also important to conduct prospective longitudinal studies that would shed light on cause-effect relations between attachment security and psychopathic traits and changes in these relationships across time from infancy to adulthood. Longitudinal studies would also enable the exploration of different pathways that lead to the development of attachment organization and psychopathic traits in girls and boys. Our findings emphasize the importance of investigating relations between attachment and three dimensions of psychopathic traits separately in female and male adolescents and gaining better understanding of various manifestations of psychopathic traits in girls and boys.

Table 5
Differences in psychopathic traits between boys with secure and insecure attachment styles to father.

	Secure attachment style (S) (n = 27)	Dismissing attachment style(Ds) (n = 57)	Preoccupied attachment style(P)(n = 19)	Disorganized attachment style(Dr) (n = 19)	F value	p	partial η^2	Bonnefroni post hoc test
	M(SD)	M(SD)	M(SD)	M(SD)				
Total psychopathy (P)	60.78 (11.60)	65.61 (11.89)	63.84 (14.84)	64.42 (11.57)	0.725	0.61	0.03	
CU traits (P)	55.74 (8.82)	64.04 (9.99)	61.74 (13.89)	62.47 (9.73)	2.65	0.03	0.11	S < Ds
Impulsivity (P)	59.89 (8.67)	62.46 (11.10)	61.95 (9.97)	63.79 (10.49)	0.575	0.72	0.02	
Narcissism (P)	55.81 (12.04)	57.21 (11.18)	57.11 (14.52)	56.89 (13.07)	0.15	0.98	0.01	

P – parent.

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