Early Antisocial Markers and Attachment Styles: Their Influence on Psychopathic Characteristics in High-Risk Boys and Girls

by

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Abstract

While the relationship between attachment as a general construct (i.e., closeness to caregivers) and psychopathy has been partially explored, few studies have investigated attachment dimensions and either psychopathy as a general construct or its various facets. The current study examined attachment anxiety versus attachment avoidance within adolescent-mother relationships in relation to psychopathy in 80 high-risk adolescents (30 females). The moderating role of conduct disorder (CD) onset regarding attachment dimensions and psychopathy also was assessed because of its importance in predicting and explaining multiple negative life outcomes. Regression analyses revealed a significant interaction between childhood-onset CD and attachment avoidance in relation to the affective facet, but not to the interpersonal and behavioural facets of psychopathy. Further, exploratory analyses, as predicted, confirmed that there was a likely gender difference regarding CD in its relationship to attachment and psychopathy. These findings support the differential importance of psychopathy facets when assessing attachment.

Keywords: Psychopathy; adolescence; attachment dimensions; forensic; clinical; conduct disorder onset

Acknowledgements

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List of Acronyms

AAI	Adult Attachment Interview
ASD	Antisocial Personality Disorder
AL	Adolescent Limited
CAPAI	Comprehensive Adolescent-Parent Attachment Inventory
CAPP	Comprehensive Assessment of Psychopathic Personality
CD	Conduct Disorder
CPA	Chronic Physical Aggression
CU	Callous-unemotional
DICA-R	The Diagnostic Interview for Children and Adolescents-Revised
DSM-IV-TR	Diagnostic and Statistical Manual of Mental Disorders – 4th edition (text revision)
ECR	Experiences in Close Relationships
FFM	Five Factor Model
ICC	Intraclass Correlation Coefficient
I-CP	Impulsivity-Conduct Problems
IPPA	Inventory of Parent and Peer Attachment
LCP	Life Course Persistent
MCAR	Missing Completely at Random
MI	Multiple Imputation
MMR	Moderation Multiple Regression
MTI	The Minnesota Temperament Inventory
PCL	Psychopathy Check List
PCL: R	Psychopathy Checklist: Revised
PCL: SV	Psychopathy Checklist: Screening Version
PCL: YV	Psychopathy Checklist: Youth Version
SEM	Structural Equation Modelling

1.   Introduction

An important theoretical and related empirical research theme has been whether the Psychopathic Personality Disorder (PPD) can be extended downward into adolescence and further into childhood either as full personality syndrome, dimensions, facets, or traits (Salekin & Lynam, 2010a). From the beginning of the identification and conceptualization of PPD, there has been a lack of theoretical consensus concerning its dominant dimension (i.e., interpersonal, affective, or behavioural) and whether different dimensions were dominant, depending on whether it was utilized to describe individuals from either general population, clinical, or institutional (usually custody) samples (Corrado, 2011; Kotler & McMahon, 2010). In contrast to Cleckly (1941), McCord and McCord (1964) asserted that cruelty and aggressiveness were central rather than impairments in emotional processing (i.e., lack of affect). There was, though, a consensus that both lack of anxiety and affective responsiveness fostered social disconnectedness and therefore, lack of attachment with others. However, for theorists concerned with institutional samples, the focus became on whether these psychopathic traits explained cold, violent, and predatory criminals, in particular serial killers and rapists. This theme became prominent when Hare (1980) developed the original Psychopathy Check List (PCL) in the 1970s and its subsequent versions including the Psychopathy Checklist: Revised (PCL: R; Hare, 1991, 2003) and the youth version, the PCL: YV (Forth, Kosson, & Hare, 2003). The PCL: R became the "gold standard" measurement instrument for PPD and it spawned several other instruments for general samples, including self-administered versions (Kotler & McMahon, 2010). The main issue with the PCL and derivative instruments has been the dominance of the behavioural dimension, especially the delinquent and criminal indicators in predicting subsequent criminal behaviours for both adult and adolescent samples (Corrado, Vincent, Hart, & Cohen, 2004; Vincent, Odgers, McCormick, & Corrado, 2008). Nonetheless, more recent research on children and adolescents has highlighted the original PPD conceptual emphasis on callous-unemotional (CU) traits. An important outcome of this research was the identification of genetic markers for CU traits (Loney,

Frick, Clements, Ellis, & Kerlin, 2003; Viding, Blair, Moffitt, & Plomin, 2005). However, traditional environmental factors such as parental warmth and involvement appeared to be related the stability of CU traits across developmental childhood, adolescent, and young adulthood stages (Frick, Kimonis, Dandreaux, & Farewell, 2003; Pardini, Lochman, & Powell, 2007). While a *lack of closeness* to caregivers has been analyzed (Flight & Forth, 2007; Kosson, Cyterski, Steuerwald, Neumann, & Walker-Matthews, 2002), there has been surprisingly little research investigating more closely how parental involvement in the form of *attachment dimensions or subtypes* might be related to the key dimensions or facets of PPD. Yet, there is a long history of research in developmental psychology and criminology that has confirmed the central importance of the initial bonding between infant and mother and then subsequent parent-child relationship styles (Farrington, 2003; Gottfredson & Hirschi, 1990; Patterson, Forgatch, Yoerger, & Stoolmiller, 1998; Wilson & Hernstein, 1985).

In effect, a fundamental tenet of attachment theory is that child-caregiver attachment influences future relationships both regarding pro-social and antisocial behaviour patterns (Bowlby, 1973). Bowlby (1973) originally asserted that early child-caregiver relationships establish a child's cognitive-affective structure called an "internal working model" that serves to guide interpersonal expectations, behaviours, and responses. As later proposed by Saltaris (2002), a link between early aversive interpersonal experiences with primary attachment figures might serve as a precursor for developing a callous, detached, and cold-hearted demeanour central to PPD. Theoretically, it can be argued that attachment avoidance is the most consistent with key psychopathy traits since it reflects deactivation of the attachment system (Noftle & Shaver, 2006). Further, those who endorse a predominantly avoidant attachment style have low anxiety about relationships and are not concerned about potential rejection. In contrast, those with attachment anxiety are hypersensitive to rejection and abandonment and thus, persistently pursue relationships with others in a coercive way (Noftle & Shaver, 2006). While there has been empirical support for the general relationship between attachment and psychopathic characteristics, there is a paucity of research concerning attachment dimensions and subtypes.

The present study examines several hypothesized relationships between attachment dimensions and psychopathy in a sample of high-risk for criminal offending

adolescent boys and girls. In addition, this study examines whether conduct disorder (CD) onset plays a moderating role on the relationship between attachment avoidance and psychopathy factors. The hypothesized moderating relationship of CD-onset on the central relationship between attachment avoidance and psychopathy, therefore, will also explored. Specifically, first, it is hypothesized that high-risk adolescent boys and girls with childhood-onset CD will exhibit higher interpersonal, affective, and behavioural features compared to those with adolescent-onset CD, based on the developmental taxonomy of antisocial behaviour (Moffitt, 1993, 2003). Second, it is further hypothesized that sample youth with childhood-onset CD will have the strongest association between psychopathic traits and attachment insecurity, specifically, attachment avoidance in the context of adolescent-mother relationships. Generally, therefore, it is expected that both boys and girls high on the PCL: YV will more frequently exhibit higher attachment avoidance in adolescent-mother relationships, along with possible gender differences concerning CD-onset. Specifically, it is proposed that girls with childhood-onset CD will have stronger associations between attachment avoidance and psychopathy factors than boys based on the gender paradox theory which states that in disorders with unequal gender ratios, the gender with the lower prevalence rate, in this case, girls with conduct disorder, will have more severe forms of psychopathology than boys (Loeber & Keenen, 1994). From this, it is proposed that girls with CD will have poorer outcomes (i.e., stronger associations between attachment avoidance and psychopathy factors). Before presenting the methodology and results of the present study, I will discuss: 1) psychopathy in adolescents; 2) the importance of developmental distinctions; 3) attachment theory and the developmental outcomes; and 4) attachment theory and its link to adolescent psychopathy.

1.1. Psychopathy in Adolescents

As mentioned above, psychopathy has been conceptualized as a personality disorder with several underlying dimensions or facets, typically including the interpersonal, affective, behavioural, and lifestyle. The original two-factor model Psychopathy Checklist (PCL; Hare, 1980) was derived from the Cleckley's initial conceptualization (1941). Cooke and Michie (2001) proposed an alternative structural model of psychopathy that parsed Factor 1 into two factors or facets, "arrogant and

deceitful interpersonal style" and "deficient affective experience" and labelled Factor 2 as "impulsive-irresponsible behavioural style" (see Table 1).

Table 1.   Cooke and Michie's (2001) Model of Psychopathy

Arrogant & Deceitful Interpersonal (Factor 1)	Deficient Affective Experience (Factor 2)	Impulsive-Irresponsible Behavioural Style (Factor 3)
Impression management	Lack of remorse	Stimulation seeking
Grandiose sense of self-worth	Shallow affect	Parasitic orientation
Pathological lying	Lack of empathy/callous	Lacks goals
Manipulation for personal gain	Failure of responsibility	Impulsivity
		Irresponsibility

Cooke and Michie (2001) asserted that the behavioural facet should not include either specific criminal behaviour or socially deviant behaviours because these behaviours theoretically are best explained as outcomes or as covariates to be predicted from or associated with the more traditional conceptualization of general personality traits utilized in defining personality disorder constructs such as psychopathy. In other words, this approach reconceptualised PPD away from one of the original perspectives that focused on the violent and antisocial behaviours (Schneider, 1934) toward Cleckley's perspective that focused on the affective and interpersonal dimensions. Skeem, Mulvery, and Grisso (2003) confirmed the predictive validity of the three-factor model in predicting violence and antisocial deviance. Results showed that the affective facet was most strongly associated with violent criminal offending (e.g., assault, weapons, possession, kidnapping, and murder). However, the behavioural facet was most strongly associated with overall frequency and severity of criminal offending, incidences of property crimes, and substance-related disorder, while the interpersonal facet was most associated with past and future antisocial behaviour, albeit, to a lesser degree than the other two factors. Finally, the affective facet was also strongly associated with the classical Five Factor Model (FFM; Costa & McCrae, 1992) key personality correlates of aggressiveness, low agreeableness, and low affiliation (low social closeness), consistent with more recent research on psychopathic traits and the FFM (Roose et al., 2012). The affective facet of the three-factor model of PPD, therefore, is important in explaining the ability to foster closeness with others and by extension, the likelihood of developing an insecure attachment style.

In response to Cooke and Michie's reconceptualization of PPD, Hare (2003) further deconstructed the original model conceptualization of his 20-item PCL-R into four factors: "interpersonal", "affective", "behavioural", and "lifestyle". As mentioned above, the PCL: YV for adolescents was developed in 2003 by Forth, Kosson, and Hare. The PCL: YV has been validated in several studies and is also considered "the gold standard" in measuring psychopathy in adolescents. While both the three-factor and four-factor models of psychopathy have been supported in adolescent research (see Andershed, Kohler, Louden, & Hinrichs, 2008; Forth et al., 2003; Neumann, Kosson, Forth & Hare, 2006), the inclusion of violent and criminal behaviours has been viewed as tautological by several researchers (Farrington, 2005; Skeem & Cooke, 2010).

Despite the on-going debate about the appropriate dimensional structure of the PCL: YV, arguably, the three-factor model is more consistent with assessing the attachment construct and CD-onset based hypotheses and, therefore, will be used in this study. Furthermore, while psychopathy is viewed as a unitary construct, its factors are hypothesized to have a differential importance regarding attachment dimensions, resulting from the cardinal importance of the affective facet over the interpersonal and behaviour facets in understanding psychopathy as a different construct from other disorders with similar behavioural dimensions, such as conduct disorder and antisocial personality disorder (APD; Loney et al., 2003; Patrick, 2010; Salekin & Frick, 2005). Further, even though psychopathy factors are highly intercorrelated, they have demonstrated different criterion outcomes (Skeem et al., 2003). Thus, controlling for psychopathy factors are essential in regression models in order to understand each factors unique effect on attachment, especially given the paucity of research addressing this relationship.

1.1.1.   The Expression of Adolescent Psychopathy: Important Differences from Adulthood

In Salekin and Lynam's *Handbook of Child and Adolescent Psychopathy* (2010b) several chapters focus on the differences found in the empirical research on extending the psychopathy construct into adolescence from adulthood. A fundamental difference involves the presence of anxiety in the latter developmental stage versus its fundamentally predicted absence in adulthood. This difference has important theoretical

considerations in assessing the validity of PPD measurement instruments in the adolescence stage.

1.1.1.1. Anxiety and Psychopathy

Callous-unemotional traits are the core features of psychopathy, which have been hypothesized to result from deficits in processing fear and anxiety (Fowles, 1980; Hare, 1970). While extensive research has consistently confirmed that adult psychopaths show little anxiety (Hare, 1991; Hart & Hare, 1989; Lilienfeld & Penna, 2001), the far fewer studies of adolescent research on psychopathy have found the opposite (Kubak & Salekin, 2009; Lee, Salekin, & Iselin, 2010). Lee et al. (2010) demonstrated that a group of adolescent males categorized as highly psychopathic also had high trait anxiety. Additionally, Kubak and Salekin (2009) also found a significant positive relationship between trait anxiety and psychopathy total scores in adolescents, as Kosson et al. (2002) did earlier. Initially, this fundamental and critical difference has been the essence of the debate about the validity of the PPD construct for adolescents (Seagrave & Grisso, 2002). However, subsequent research has provided considerable support for the relevance of psychopathy and the PPD construct in adolescence despite the need to modify its use for this developmental stage both conceptually and regarding specific traits (Corrado, in press; Salekin et al., 2010). Hence, future research on the validity of the PCL: YV may need to consider anxiety in the adolescent version, perhaps by allowing trait anxiety to be coded as a protective factor against primary psychopathy. Additionally, the presence of anxiety has been speculated to denote a secondary type of psychopathy, traditionally theorized by Karpman (1949) and more recently by Lee et al. (2010). Several other concerns have been raised about the applicability of the current construct of psychopathy, most importantly regarding adolescent females.

1.1.2. The Applicability of Psychopathy in Females

More recent research has raised specific concerns about the predictive validity of the PPD construct for adolescent females (Odgers, Reppucci, & Moretti, 2005; Schrum & Salekin, 2006). Very importantly, Odgers et al. (2005) found that maltreatment completely mediated the relationship between psychopathy and offending behaviour in adolescent females. Edens, Campbell, and Weir's (2007) meta-analyses on the applicability of psychopathy during adolescence found a non-significant relationship

between PCL: YV scores and recidivism among adolescent females. Sevecke, Pukrop, Kosson, and Krischer (2009) then found that the two- three- and four-factor model did not provide acceptable fit among adolescent females in both incarcerated and community samples. Regarding internal construct validity assessments, Schrum and Salekin (2006) found that the interpersonal and affective components of psychopathy were conceptually more relevant than the behavioural factor traits, which confirmed Salekin, Rogers, and Sewall's (1997) findings for adult females. Specifically, the most discriminating traits of the underlying construct of psychopathy for girls were "callousness/lack of empathy", "conning and manipulation", and "a grandiose sense of self-worth". Nonetheless, despite the apparent higher discriminating importance of these traits and related factors over the behavioural traits for females, other research found that the traditional personality focused factor traits were also important for males, albeit less so (Cooke & Michie, 1997, 1999). However, the above differences for adolescents versus adults and gender differences both suggest the need to consider further potential distinctive aspects of the personality facets of psychopathy for adolescents based on predicted differences from developmental theories.

1.1.3.   Predictive Validity of Psychopathy during Adolescence

Loney, Taylor, Butler, and Iacono (2007) assessed the stability of psychopathy from the oldest adolescent stage (ages 16-18) to the youngest adulthood stage (ages 19-24). The Minnesota Temperament Inventory (MTI) was used to assess psychopathy and factor analysis confirmed two age consistent factors (i.e., "emotional detachment" and "antisocial tendencies"). The intraclass correlation coefficients (ICCs) over the two time periods were 0.40-0.41, which indicated a moderate level of stability for these two MTI measured factors of psychopathy. Using the PCL: YV in a 7-year follow-up study, Stockdale, Olver, and Wong (2010) found that PCL: YV scores predicted non-violent, general, and violent recidivism in a sample of 161 Canadian youth offenders (88 males, 73 female) using both the three-factor and four-factor model. In an earlier longitudinal study, Gretton, Hare, and Catchpole (2004) were able to predict offending behaviour over a 10-year period in a sample of 157 boys from ages 12 to 18 also using the PCL: YV. In addition, individuals who scored higher on the PCL: YV had a greater likelihood of displaying violence in adulthood. This relationship held even after controlling for conduct disorder, age of first offense, and history of violent and nonviolent offending. The

predictive validity was strongest for violent offenders regarding both likelihood of violent offending and latency of first post assessment violent offense. Using the two-factor model, Gretton et al. (2004) found that Factor 2 (Lifestyle-Antisocial) outweighed Factor 1 (Interpersonal-Affective) in its prediction of violent outcomes.

In contrast, the CU traits of psychopathy were more predictive in distinguishing more severely aggressive and violent antisocial youth (Enebrink, Anderson, & Langstrom, 2005; Frick, Cornell, Barry, Bodin, & Dane, 2003). In addition, CU traits predicted a more stable and higher rate of both delinquent behaviours (Frick et al., 2003; Lynam, 1997) and instrumental aggression (Frick et al., 2003). As well, Burke, Loeber, and Lahey (2007) found CU traits indexed in a sample of clinic-referred boys at ages 7 to 12 predicted adult measures of psychopathy at ages 18 to 19. Additionally, Lynam, Caspi, Moffitt, Loeber, and Stouthamer-Loeber (2007) also reported that early measures of CU-related traits at age 13 predicted adult measures of psychopathy at age 24.

It is evident in the above brief review of the research concerning the predictive validity of the two-factor model of psychopathy that there is variability in the strength of the behavioural facet and the affective facet or traits regarding several aggression and violence outcome variables. Even after considering differences in specific outcome measures and samples as possible explanations for this variability, there is a lack of consensus concerning the relative importance of each factor in predicting and understanding aggression and violence among adolescents. Nonetheless, there is a theoretical consensus that the affective facet, specifically the CU traits, are central to the conceptualization of psychopathy for both adults and adolescents and for its predictive validity regarding outcome variables such as serious delinquency, aggression, and violence in all developmental stages (White & Frick, 2010).

1.2. The Importance of Developmental Distinctions

Even though there has been an on-going debate about both CD and PPD concerning their respective relevance to understanding aggression and violence among children and adolescents, there have been efforts to first, distinguish these personality disorders and, second, to assess whether CD is related to the development of PPD (i.e.,

does the former precede the latter; Kosson et al., 2002; Sevecke & Kosson, 2010).
However, lifetime CD has not been associated with all the facets of psychopathy
(Loeber, Burke, Lahey, Winters, & Zera, 2000). In other words, the key link between
psychopathy and CD is likely associated with developmental themes since childhood-
onset CD has been most strongly related to the personality and behavioural dimensions
of psychopathy (Dandreaux & Frick, 2009; Gretton, 1998; Sliverthorn, Frick & Reyonds,
2001). In order to understand this relationship, it is essential to note the two hypothetical
prototypes of antisocial behaviours: life-course-persistent (LCP) offenders and
adolescence-limited (AL) offenders. These dual trajectories in the origins of conduct
disorder (CD) have distinct start points and different life trajectories. As hypothesized by
Moffitt (1993, 2006), LCP antisocial development stems most often from early
neurodevelopmental and family adversity, highlighting genetic etiological processes, but
also social risk factors. LCP offenders begin antisocial behaviours in childhood
("childhood-onset type") and are persistent and pathological, whereas AL offenders
("adolescent-onset type") are near normative and desist in young adulthood. Further, AL
offenders typically endorse rebellious attitudes towards authority temporarily resulting
from the influence of deviant peer groups; therefore, these traits are not stable
throughout one's lifetime. Most importantly, childhood-onset CD youth compared to
adolescent-onset CD youth have been associated with: more dispositional vulnerabilities
(Moffitt, 2003; Dandreaux & Frick, 2009); more affective and behavioural features of
psychopathy (Dandreaux & Frick, 2009; Sliverthorn et al., 2001); more severe
aggressive acts in adolescence; and more risk for antisocial outcomes in adulthood
(Moffitt, 2003). Developmentally, childhood-onset CD youth have more interpersonal
problems and biological and psychosocial risk factors for antisocial behaviours than
adolescent-onset CD youth. Additionally, as Moffitt (1993, 2006) hypothesized, LCP
offenders develop different personality structures compared to AL offenders. This might
reflect differences in their ability to relate to others and express empathetic concern.
Nonetheless, only a small-proportion of conduct disordered youth also have been
identified as having the CU traits (Frick, 2002; Salekin, 2006; Salekin & Frick, 2005). As
Rowe et al. (2010) confirmed, high CU traits were considerably more prevalent among
childhood-onset CD children (69.2%) than adolescent-onset CD children (41.3%). These
results warrant further research in the association between different antisocial
developmental pathways and personality features of PPD.

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Additionally, it is important to also consider separate developmental differences for boys and girls. As past researchers have shown, gender is important in understanding CD and different key outcomes (Loeber & Keenen, 1994). As Loeber and Keenen (1994) reported, when females have a gender atypical disorder, they suffer from more severe symptoms/forms than do their male counterparts. This phenomenon is labelled *the gender paradox* (Loeber & Keenen).

1.2.1.   *Separate Developmental Differences for Boys and Girls*

Silverthorn, Frick, and Reynolds (2001) identified "delayed onset" pathway for girls based on their findings that childhood-onset CD boys and adolescent-onset CD girls were the most likely to exhibit high levels of CU traits. In effect, adolescent-onset CD girls resembled childhood-onset CD boys on personality traits such as lack of impulse control and expression of CU traits. This developmental pathway further described girls who had cognitive and neuropsychological deficits, a dysfunctional family environment, and/or the presence of a callous and unemotional interpersonal style present in childhood (Silverthorn & Frick, 1999). Again, though, the expression of severe and overt antisocial behaviours does not begin until adolescence (Silverthorn & Frick, 1999). Still, gender differences remained; 90% of childhood-onset CD boys and 73% of adolescent-onset CD girls had high levels of CU traits. Yet, paradoxically, 66% of adolescent-onset CD girls and 54% of childhood-onset CD boys were classified as psychopathic (as measured by both high CU traits and high impulse control traits). Further, while approximately two thirds (66%) of adolescent-onset CD girls had this combination, approximately only one sixth (15%) of the boys with adolescent-onset CD did (Silverthorn & Frick, 1999). A major limitation of this research was that only two girls in the sample of 72 adolescents were diagnosed with childhood-onset CD, which precluded this key group comparison.

In contrast to several key elements of Silverthorn et al. (2001) "delayed pathway" model for girls, Moffitt and Caspi (2001) found the opposite; girls with adolescent-onset CD showed less parenting dysfunction, less temperamental vulnerability, and fewer neurocognitive deficits than childhood-onset CD girls. McCabe, Rodgers, Yeh, and Hough (2004) confirmed Moffitt and Caspi's (2001) findings in a community sample. More recent research using a growth mixture modeling research design found that girls

and boys with childhood-onset CD had similar risk factors and showed similar outcomes later on in life (Barker, Oliver, & Maughan, 2010; Odgers et al., 2008).

Much of the debate over the identification of the risk factors for separate pathways for CD in girls is associated with the low prevalence of girls with childhood-onset CD. Moffitt and Caspi (2001) theorized that given most delinquent girls were the adolescent-onset CD subtype, childhood-onset CD girls might have more severe risk profiles than childhood-onset CD boys and adolescent-onset CD girls. This key set of differences alone justifies the need to distinguish the girl childhood-onset CD pathway. Recent research showed that there were in fact, similar predictors between boys and girls with CD (Odgers et al., 2008; Pitzter, Esser, Schmidt, & Laucht, 2010) and that childhood-onset CD was more common in girls than traditionally thought (Keenan, Wroblewski, Hipwell, Loeber, & Stouthamer-Loeber, 2010). However, even though the same risk factors are present for boys and girls in developing CD, the level and severity of these risk factors likely differs based on socialization and biological differences (Zahn-Waxler, Shirtcliff, & Marceau, 2008; Beech & Mitchell, 2005).

The onset theme concerning the CD pathway is likely partly explained by the theoretical relationship between attachment hypotheses and developmental hypotheses as well as confirmatory empirical research.

1.3. Attachment Theory and Developmental Outcomes

Attachment is the enduring affective bond that is formed between an individual and attachment figure at a young age and continues to develop across the life span and generalizes to other relationships (Ainsworth, 1989; Bowlby, 1969, 1973, 1980). Attachment theory contends that a child learns empathy for others in the context of secure attachments within child-caregiver relationships, and, further, without empathy and related emotions such as sympathy and kindness, subsequent relationships throughout the life course are less likely to be positive or pro-social (Kockanska, 1995). Additionally, a lack of attachment decreases ones ability to adapt to normative social and psychological challenges throughout development (Ainsworth, 1989; Bowlby, 1973). In other words, negative attachment styles detrimentally affect psychological well-being

and adjustment across the lifespan (Laible, Carlo, & Raffealli, 2000; Rosenstein & Horowitz, 1996). More specifically, securely attached individuals are better able to regulate and modulate their emotions and behaviours (Mikulincer & Shaver, 2005) and develop empathy towards others (LaFreniere & Sroufe, 1985; van der Mark, van Ijzendoorn, & Bakermans-Kranenburg, 2002). In contrast, negative parent-child attachment relationships consistently have been implicated in the development of disruptive and aggressive behaviours (Greenberg, Speltz, & DeKlyen, 1993; Loeber & Stouthamer-Loeber, 1986; Patterson, 1986; Sampson & Laub, 1990). Determinants of negative attachment styles associated with these determinants of antisocial outcomes include coercive parent-child interactions, absence of a positive and affectionate parent-child bond, neglect, inconsistent parenting, and severity of punishment (Greenberg et al., 1993; Loeber & Stouthamer-Loeber, 1986; McCord, 1979; McCord & McCord, 1964; Patterson, 1986; Sampson & Laub, 1990). While Sarracino, Presaghi, Degni, and Innamortati (2011) did not examine specific attachment dimensions or subtypes, they reported both delinquent and aggressive behaviours were negatively correlated with attachment security to both parents for adolescent girls, but only mothers for adolescent boys. In an earlier study, Simons, Paternite, and Shore (2001) found that adolescents who self-reported a negative attachment style with their mothers also self-reported more aggressive acts.

While there is a strong theoretical base that insecure attachment styles and aggressive outcomes are related, the research addressing specific attachment dimensions and subtypes in relation to aggressive behaviours is inconclusive. From an attachment perspective, anxious attachment elicits aggressive behaviours because of an individual's fear of abandonment and rejection, whereas avoidant attachment elicits aggressive behaviours because of interpersonal disengagement. Allen, Marsh, McFarlend, McElhaney, and Land (2002) found a relationship between anxious-preoccupied attachment and delinquent activities (i.e., physical fights and assaults) where anxious attachment at age 16 predicted increased delinquent behaviours at ages 16 and 18. In conjunction, Osbuth, Luedermann, Pelef, and Moretti (2002) also found that preoccupied attachment was implicated in aggressive outcomes for boys and girls (as cited in Moretti, Dasilva, & Holland, 2004). Although, more avoidant styles of attachment have also been implicated in antisocial outcomes. For example, Voss (2001)

found that dismissing and fearful attachment styles were directly associated with more antisocial outcomes, such as drug use and delinquency. Rosenstein and Horowitz (1996) also found that attachment avoidance was related to aggressive outcomes and narcissistic personal disorder in male adolescents. While this research only looked at antisocial tendencies and not psychopathy as an outcome variable, it demonstrated that only looking at insecure attachment as a general attachment style might not give the full-depth and complexity of the relationship between attachment and psychopathy either. Therefore, dimensions should be explored. In addition, Rutter, Kreppner, and Sonuga-Barke (2009) caution that categorizing attachment styles nominally as *secure* or *insecure* is misleading because it depreciates the complexity of attachment relationships.

This attachment research clearly confirms that attachment styles are important for interpersonal connections, intimacy within relationships, and positive behavioural outcomes. Regarding the relationship between attachment and psychopathy, the central emergent hypothesis is that insecure attachment styles, particularly attachment avoidance, increases the likelihood of aggression primarily because of interpersonal disengagement and the belief that relationships are not worthwhile. Specifically, attachment avoidance is hypothesized to have a positive relationship with psychopathy factors, whereas attachment anxiety is hypothesized to have an inverse relationship. While the literature has shown there are gender related differences in attachment (see Bartholomew & Horowitz, 1991) with early developmental distinctions (see Carter, Briggs-Gowan, Jones, & Little 2003), gender differences based on attachment styles are not hypothesized for this study. For example, even though girls show more fearfulness and anxiety than boys as early as preschool (Carter et al., 2003), adolescents with high psychopathic features theoretically should have the same attachment styles (i.e., attachment avoidance). Since parenting and parent-child relationships are asserted to be central to positive attachment styles and the development of pro-social emotions such as responsibility, remorse, guilt, and generosity (Kochanska, 1995), boys and girls high on psychopathic traits are viewed as lacking parental bonds, thus lacking these pro-social characteristics and empathic concern.

1.3.1. *The Influence of Parenting in Emotional and Behavioural Regulation*

Regarding the presence of CU traits, Pardini (2006) asserted that harsh parental discipline was not related to CU traits, but it was related to impulsivity traits. In addition, while children with CU traits were unresponsive to harsh parental discipline techniques (Dadds & Salmon, 2003; Pardini, 2006), other research has shown that children were responsive to parental warmth, which aided in the development of empathy (Pardini et al., 2007). In addition to strict disciplinarian techniques, Kochanska, Barry, Stellem, and O'Bleness (2009) recently confirmed that antisocial behaviours were influenced by the quality of parent-child relationships. Specifically, infants who were insecurely attached to their mothers were more resentful and oppositional toward their mothers as toddlers compared to secure children. Despite that this study only assessed relationships during infant and toddler development stages, it reasserted the importance of caregiver-child attachment relationships in the development of emotional regulation and empathy. Additionally, for those children who displayed CU traits only or CU traits in addition to antisocial behaviours, warm and involved parents (not harsh disciplinarians) reduced the severity of CU traits and aided in development more empathetic concern towards others. Therefore, as research has suggested, insecure attachment, particularly distant, cold, and aloof relations with parents, akin to attachment avoidant style, can be detrimental in proper socialization and the development of empathy in childhood and adolescence in those with high CU traits and antisocial behaviours (i.e., psychopathic characteristics; Fowles & Kochanska, 2000; Pardini et al., 2007).

1.4. Attachment Theory and its Link to Psychopathy

Cleckley (1941) originally theorized about the relationship between of attachment and psychopathy (i.e., the emotional dysfunction pervasive in psychopathic individuals stemmed from disruptions in interpersonal bonds). McCord and McCord (1964) were the first researchers to study attachment related constructs and psychopathy. The McCords (1964) did not assess attachment directly, but instead looked at parental rejection, erratic discipline, and poor parental supervision and found that they served as environmental contributors to criminal psychopathy in children. The McCords (1964)

believed that these environmental contributors led to deficits in emotional reactivity, facilitating a detached and callous personality. Wolkind (1974) also addressed lack of attachment by looking at the link between maternal deprivation and psychopathic tendencies in orphaned children. Later on, Frodi, Dernevik, Sepa, Philipson, & Bragejo (1999) and Saltaris (2002) proposed that early psychopathic characteristics likely result from a lack of attachment to family members, especially parents.

Bowlby (1973) elaborated the theoretical understanding of attachment styles and negative life course relationships central to psychopathy. He explained that the disruption of positive or pro-social internal working models of relationships can alter a child's perception and expectation of future attachment interactions. Based on Bowlby's early work on attachment relationships, Bartholomew and Horowitz (1991) developed a model of attachment including models of self and other, with two dimensions of attachment (i.e., anxiety and avoidance) based on a semi-structured interview. Both dimensions can be combined to form the four prototypical patterns of attachment (i.e., dismissing, preoccupied, fearful, and secure). Brennan, Clark, and Shaver (1998) developed a self-report inventory of attachment called the Experiences in Close Relationships (ECR) scale based on these two higher order scales. The ECR comprises 12 attachment-related dimensions and two higher order scales: *attachment anxiety* based on rejection, abandonment, and unlovability, and *attachment avoidance* based on rejection of intimacy and the need for dependency. Importantly, these researchers view attachment as continuous, not as categorical demonstrating that individuals can display multiple attachment styles. Subsequently, other attachment questionnaires have been devised, including the Adult Attachment Interview (AAI; George, Kaplan & Main, 1985, 1996) and The Inventory of Parent and Peer Attachment (IPPA; Armsden & Greenberg, 1987). While the IPPA measures attachment in terms of closeness by measuring the degree of mutual trust, quality of communication, the extent of anger, and alienation, the AAI places individuals into categories or types based on their predominant style of attachment. For this study, the Comprehensive Adolescent-Parent Attachment Inventory (CAPAI; Moretti, McKay, & Holland, 2000) was used, which is based on a continuous scale of attachment types, similar to Brennan et al.'s (1998) model.

However, despite this trend in expanding the conceptual complexity of the attachment construct and the resulting identification of types as well as the categorical

and spectral perspectives, most of the research on the association between child-caregiver attachment and psychopathic traits has addressed attachment simplistically as a level of closeness (see Flight & Forth, 2007; Kossen et al., 2002). Kosson et al. (2002), for example, examined associations between psychopathy, interpersonal behaviour, and closeness of relationships in sample of 115 adjudicated male adolescents using the IPPA. The PCL: YV was used to assess psychopathy.

This study found that a lack of attachment to parents on the IPPA was significantly negatively correlated with psychopathy (r = -.33, *p* < .01). Two open-ended questions not apart of the IPPA were also asked, in which youth self-reported closeness to their parents and overall closeness to their families. Self-reported closeness to parents was significantly negatively correlated with PCL: YV scores (r = -.23, *p* < .05), yet, while the correlation for parents' ratings of the adolescents' closeness was similar, it was not statistically significant (r = -.24, *p* = .08). Self-reported closeness to their families was also significantly negatively correlated with PCL: YV scores (r = -.35, *p* < .01). Even though Kosson et al. (2002) did not look at attachment dimensions, their research was still informative regarding how closeness is implicated in psychopathy.

In another small sample study of 14 adult male criminal offenders, Frodi et al. (2001) used the AAI to assess early attachment relationships and experiences with parents and other attachment figures. While they reported a high prevalence of dismissing attachment, psychopathy was not related to a specific attachment classification; a near-identical distribution of attachment styles among high and low scorers on the Psychopathy Checklist: Screening Version (PCL: SV; Hart, Cox, & Hare, 1995). An important finding, though, was close to two-thirds of the sample was characterized by an inability to see the value of attachment figures and attachment-related experiences. There was little discussion of attachment during their childhood and adolescence, and a very poor memory of childhood experiences with caregivers. These results, however, have very limited generalizability given the small sample and the narrow range in psychopathy scores (9-19 on a 24 scale).

In contrast, using a larger sample of 51 incarcerated male adolescents, Flight and Forth (2007) found several significant relationships. The IPPA was employed to measure attachment and the PCL: YV for psychopathy. The total psychopathy score

was negatively correlated with self-reported attachment to fathers but not to mother or peers. Among the four factors, the strongest relationship between psychopathy and attachment to fathers involved Factor 3 (r = -.31, *p* < .05); the PCL: YV total score was also significant (r = -.35, *p* < .05). The other facets were not statistically significant. In addition, empathy and psychopathy were also negatively correlated for Factors 1 through 4 (r = -.26, ns[1]; r = -.53, *p* < .001; r = -.37, *p* < .01; r = -.40, *p* < .01, respectively).

Lastly, Catchpole (2008) used the same sample data as the current research study and found some interesting preliminary findings with respect to gender and individual psychopathy factors. Catchpole was the only prior researcher to look at attachment dimensions (avoidance and anxiety) and subtypes (dismissing, fearful, preoccupied, secure) with respect to psychopathy. As results showed, in this sample of 110 high-risk boys and girls, those with lower attachment security displayed more callousness and lack of empathy (Factor 2). This study also reported some gender differences. When looking at attachment dimensions, girls with higher attachment anxiety[2], also had higher lifestyle (Factor 4) and total psychopathy scores, whereas boys with higher attachment anxiety had lower lifestyle and total psychopathy scores on the PCL: YV. No relationships were found between attachment avoidance[3] and psychopathy factors. When looking at attachment subtypes, results showed that boys with higher attachment dismissiveness (low anxiety, high avoidance) had higher lifestyle scores (Factor 4) and total psychopathy scores, whereas girls with higher attachment dismissiveness had lower lifestyle scores (Factor 4) and total psychopathy scores on the PCL: YV. Also, if boys showed higher attachment fearfulness (high anxiety, high avoidance), they had lower lifestyle scores (Factor 4) on the PCL: YV; there was no relationship for girls. Catchpole (2008) theorized that, generally, attachment insecurity caused specific disruptions in parent-adolescent relationships, but differed by gender.

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[1] Flight and Forth (2007) did not report the non-significant probability levels.
[2] Attachment anxiety: fearful + preoccupied – dismissing – secure.
[3] Attachment avoidance: dismissing + fearful – preoccupied – secure.

1.4.1. The Role of Attachment and Psychopathy

Based on the above admittedly limited research, it appeared that lack of attachment was positively related to psychopathy. Theoretically, it can be argued that the attachment avoidance type is the most consistent with key psychopathy traits since it reflects discomfort with close relationships and dependence on others. Also, as discussed above, attachment avoidance was a risk factor for interpersonal violence and antisocial behaviours (Finzi, Ram, Har-Even, Shnit, & Weizman, 2001; Nakash-Eiskovits, Dutra, & Westen, 2002). More specifically, Kossen et al. (2002) found that PCL: YV scores were positively related to aggression and delinquency and were negatively associated with closeness to family members and attachment to parents. Nakash-Eiskovits et al. (2002) found further that attachment avoidance was highly associated with aggressive and externalizing scales. Finally, Catchpole (2008) reported that lower levels of attachment security were associated with higher level of callousness and lack of empathy (Factor 2).

It was further proposed that, at least regarding adults, there appeared to be a theoretical consensus that those high on psychopathic traits had low anxiety in general (Cleckley, 1941; Karpman, 1949; McCord & McCord, 1964) and therefore, this lack of anxiety should be seen within relationships. Following this assertion, therefore, it is hypothesized that attachment anxiety is inversely related to psychopathy. The explanation for this hypothesis is that because attachment anxiety involves unease about being abandoned or rejected by others, this attachment type is inconsistent with the two key psychopathy traits, lack of remorse and lack of empathy. In effect, attachment anxiety has been associated with measures of withdrawal, internalization and introversion (Nakash-Eisikovits et al., 2002). However, regarding adolescents, recent research had consistently indicated a positive relationship between psychopathic traits and trait anxiety, albeit, not anxiety within relationships (Kubak & Salekin, 2009; Lee et al., 2010).

1.4.2. *Childhood-onset Conduct Disorder as a Potential Moderator of the Relationship Between Attachment Avoidance and Psychopathy*

One theoretical perspective of psychopathy is that, in part, it is associated with major conduct problems in childhood (Rowe et al., 2010). More generally, the child onset of serious conduct problems has been central to the dominant developmental theoretical perspective of long-term aggression and violence trajectories (see Caspi & Moffitt, 2006; Moffitt, 1993, Moffitt, 2006). This early life low behavioural inhibition in turn places childhood-onset CD youth at an increased risk for developing callous traits because of their lack of distress by the misfortunate of others (Kockanska, 1993, 1997). The theoretical explanation for this relationship is enormously complex since it includes a wide range of risk factors involving genetic factors, epigenetic, and environmental factors (Barnes, Beaver, & Boutwell, 2011). However, one developmental pathway suggested that atypical aggression and violence in childhood, particularly after ages three and four are related to life course or Chronic Physical Aggression (CPA). In turn, CPA has been associated with parental discipline styles, childhood-onset CD, and psychopathic traits (Farrington, Ttofi, & Coid, 2009; Moffitt, Caspi, Dickson, Sliva, & Stanton, 1996). Very early, Bowlby (1944) and then Winnicott (1971) hypothesized that early antisocial behaviour was associated with insecure attachment to caregivers. In contrast, adolescent-onset CD was associated with more pro-social attachments even though affiliation with deviant peers during early adolescence (along with lack of parental monitoring) resulted in antisocial behaviour (Moffitt, 1993; Moffitt & Caspi, 2001).

1.5. The Present Study

The purpose of the present study is to gain a more comprehensive understanding of the association between attachment insecurity and psychopathic traits, while also exploring early behavioural disturbances and possible differences across gender. The attachment construct was limited to the two-higher order attachment dimensions (i.e., attachment avoidance and attachment anxiety) rather than the four attachment categories (i.e., dismissing, preoccupied, fearful, and secure). There were two reasons for this decision. First, the association between attachment and psychopathy has not been extensively studied, especially with adolescent girls, therefore

staying with higher-order attachment dimensions allowed for simpler models. Second, as Noftle and Shaver (2006) demonstrated, the two-dimensional model of attachment is more accurate and valid than the four-dimensional model originally proposed by Bartholomew and Horowitz (1991).

This study also explores how childhood-onset CD impacts the strength of the relationship between attachment avoidance and psychopathic traits. Previous research has shown that childhood-onset CD increased the risk of developing more severe deviant behaviours later in life when compared to those with adolescent-onset CD (Moffitt, 1993, 2006; Moffitt & Caspi, 2001). Additionally, there has been some evidence to suggest that early behavioural problems likely impact youth severely interpersonally as well as behaviourally (Rowe et al., 2010). To address the shortcomings of previous research, this study extends Catchpole's (2008) study by taking early behavioural disturbances into consideration. In addition, this study focuses on the unique contribution of each factor, while controlling for other factors, allowing the ability to study which factors are the most effected by attachment insecurity and therefore, are the most important to investigate further.

Additionally, exploratory analyses were conducted concerning both early behavioural disturbances and gender differences between boys' and girls' attachment avoidance and psychopathic traits. Generally, girls have been under researched concerning the relationship between attachment and psychopathy despite the single study that reported gender differences.

1.5.1.   Hypotheses

Several specific hypotheses and research questions were derived from the above theoretical and empirical research literatures.

Hypothesis 1: Attachment avoidance will be positively related to the 1) interpersonal features, 2) affective features, and 3) behavioural features of psychopathy.

Hypothesis 2: Attachment anxiety will be inversely related to the 1) interpersonal features, 2) affective features, and 3) behavioural features of psychopathy.

Hypothesis 3: Individuals with childhood-onset CD will exhibit a stronger relationship between attachment avoidance and psychopathy factors than those with adolescent-onset CD.

Exploratory Question: How does the relationship between attachment avoidance and psychopathy differ based on CD-onset and gender?

2. Methods

2.1. Overview

This study was part of a larger longitudinal project on aggression among high-risk youth. The data used for this project was drawn from the first phase of the larger study where multiple interviews and self-report measures were administered to youth in community and forensic settings. Data from three additional time points was gathered, however, since trajectories were not theorized about in this study, the analysis involved only time one data.

2.2. Participants and Procedure

Participants in the time one phase included 179 adolescents (boys: 97, 54.2%; girls: 82, 45.8%) from two institutional locations within British Columbia: a provincial mental health center for youth with severe behaviour problems (45%), two custody centers (53%), and a probation office (2%). Participants mean age was 15.34 (SD = 1.53, $Range$ 12-18).

In the forensic setting (e.g., custody centers and probation office), 132 legal guardians were approached and asked if they would give consent for their child to participate in this study. Out of the 132 approached, 28 (21%) refused. Of the 104 youth whose parents gave consent, 5 youth (5%) refused to assent and one youth withdrew prior to completing the study (<1%). In the mental health setting, 102 legal guardians gave consent. Of these youth, 19 (19%) refused to give assent and two (2%) withdrew prior to completing the study. No significant differences were found between youth who participated versus those who did not participate with respect to age [F (1, 226) = .78, p < .05] and gender (X^2 = .31, p < .05).

The study was conducted in three separate 1 to 2 hour interview modules, administrated from 2003 to 2006. Since the overall aim of the larger project was to address gender differences in high-risk youth, girls were oversampled. Boys were then matched with girls based on age. An exclusionary criterion was mental handicap (IQ < 70) and the presence of a significant Axis 1 psychotic symptomatology. This was assessed based on file review in both samples. Participants received a $30 cash honorarium or a gift certificate after completing time one measures. Confidentially was maintained throughout the study by the use of subject codes and storing information in locked filing cabinets. The present study received approval from the Simon Fraser University Research Ethics Board and permission from the director of the Ministry for Children and Family Development.

2.3. Treatment of Missing Data and Sample Descriptives

Of the 179 youth who were interviewed as part of the time one data collection, only the participants with complete data on The Diagnostic Inventory for Children and Adolescents-Revised (DICA-R*)* were eligible since a diagnosis of conduct disorder (CD) was necessary for all main analyses. Of the eligible 141 participants, rates of missing data were moderate: 12.8% for attachment and 17.0% for psychopathy, with a total of 22% missing values across all participants and measures of interest. According to Widaman (2006), more than 10-15% or more missing data requires statistical techniques such as multiple imputation (MI; Rubin, 1987). Nonetheless, cases with missing data can be deleted if they are missing completely at random (MCAR) without producing biased parameter estimates (Enders, 2010). In other words, MCAR refers to unsystematic missing data that allows for the observed data to be considered a "subsample of the hypothetically complete data" (p. 7, Baraldi & Endres, 2010). This assumption was assessed with Little's MCAR test, which is part of the expectation-maximization (EM) test in the Missing Values Analysis option in SPSS 19.0 version. The null hypothesis for Little's MCAR test states that a statistically significant test statistic provides evidence against the MCAR mechanism. Little's MCAR procedure, therefore, is essentially an omnibus test that evaluates whether all of the missing data patterns in a data set are mutually consistent with the MCAR mechanisms (Enders, 2010). In this study, given that

the value for Little's MCAR chi-square statistic was greater than .05 for the EM mean, covariance and correlation tables, the data was considered MCAR.[4]

In addition to testing individual variables that might be potential correlates of overall missing data, Student's *t*-tests with groups were also compared for each quantitative variable to specify first, groups where a variable is present or missing, and, second, if there were any statistical differences between the two groups of variables (Enders, 2010). Separate Student's *t*-tests revealed no significant differences between the present and missing variables. These tests were replicated using independent sample *t*-tests in the *Analyze* option in SPSS and showed no significant differences between the eligible sample and the complete sample based on demographic information or key variables used in this study. To summarize, according to Little's MCAR test and multiple *t*-tests, the missing cases were confirmed to be MCAR and deleted from the final analyses.[5] Nonetheless, while the 141 eligible participants had unsystematic missing data, this does not generalize to the entire data, but only the specific analysis for this study (Baraldi & Enders, 2010).

Two samples were used for this study: a full sample and a subsample. The full sample was used for all the preliminary analyses and the subsample was used for the main hypotheses. Assessing the full sample – those with no CD diagnosis and lifetime CD – was necessary for the preliminary analyses although for the main analyses, individuals with childhood-onset or adolescent-onset CD were only of interest, particularly for the moderation models. The sample that was used for each analyses is explicitly stated noted for each table/graph.

The final full sample consisted of 110 participants (boys: 64, 58.2%; girls: 46, 41.8%) from two different locations: a forensic setting (50%) or a mental health setting (50%). The participants had a mean age of 15.36 (*SD* = 1.47, *Range*: 12-18). The racial

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[4] Little's MCAR test: X^2 =13.14, df=18, *p* =.783.

[5] Other methods such as mean imputation and regression imputation were not used over complete deletion because they fail to account for the variability that is present in the hypothetical data values (Baraldi & Enders, 2010). Therefore, a smaller sample was used which resulted in smaller effect sizes, but this was viewed as a better option than lack of variability.

composition of the sample was 73 Caucasian (66.4%), 26 Aboriginal (23.6%), and 11 Other (10%), where South Asian and Hispanic comprised less than 1% of the combined category. The subsample consisted of 80 participants (boys: 50, 62.5%; girls: 30, 37.5%) from two different locations: a forensic setting (58.8%) or a mental health setting (41.3%). The participants had a mean age of 15.41 (*SD* = 1.46, *Range*: 12-18). The racial composition of the sample was 53 Caucasian (66.4%), 19 Aboriginal (23.8%), and 8 Other (10.2%). To ensure that the full sample used was similar to the larger study sample, several comparability checks were run. No differences on participants' age, gender, ethnicity, location, or scores on psychopathy or attachment were found (see Tables 2 & 3). It should be noted that for Table 3, the PCL: YV 3-Factor model has a range of 0-32, therefore, the highest score would be 32, not 40 like the 4-Factor model.

Table 2.   *Complete Sample vs. Full Sample and Demographic Variables*

	Complete Sample n =110	Full Data N =179
Quantitative Data		
Age (M, *SD*)	15.36 *(1.47)*	15.34 *(1.53)*
Qualitative Data	Prevalence (%)	Prevalence (%)
Gender	(0) Boys (58.2)	(0) Boys (54.2)
	(1) Girls (41.8)	(1) Girls (45.8)
Ethnicity	(0) Caucasian (66.4)	(0) Caucasian (66.7)
	(1) Aboriginal (23.6)	(1) Aboriginal (23.2)
	(2) Other[a] (10.0)	(2) Other[b] (10.1)
Location	(0) Forensic (50.0)	(0) Forensic (56.4)
	(1) Mental Health (50.0)	(1) Mental Health (43.6)

[a] Other comprised South Asian, Hispanic, and Other.
[b] Other comprised African/Caribbean, Asian, South Asian, Hispanic, and Other.

Table 3. Complete Sample vs. Full Sample and Key Study Variables

Quantitative Data	Complete Sample n =110	Full Data N =179
Psychopathy	M *(SD)*	M *(SD)*
PCL: YV Factor 1 Scores	3.24 *(1.70)*	3.38 (1.76)
PCL: YV Factor 2 Scores	4.18 *(1.83)*	4.15 *(1.86)*
PCL: YV Factor 3 Scores	6.11 *(1.98)*	6.29 *(1.97)*
PCL: YV Total Scores	13.52 *(4.47)*	13.83 *(4.50)*
Attachment Dimensions		
Avoidance	3.25 *(1.76)*	3.29 *(1.77)*
Anxiety	2.50 *(1.37)*	2.59 *(1.51)*

2.4. Measures

2.4.1. Comprehensive Adolescent-Parent Attachment Inventory (CAPAI)

The Comprehensive Adolescent-Parent Attachment Inventory (CAPAI) developed by Moretti et al. (2000) is a 56-item measure[6] of adolescent-parent attachment originally developed for clinical and empirical purposes at the Maples Adolescent Treatment Centre in Burnaby, British Columbia. The CAPAI measures two higher-order subscales: attachment avoidance (e.g., "I find it hard to depend on my mother"; "I usually discuss my problems and concerns with my mother [reverse coded]") and attachment anxiety (e.g., "I need a lot of reassurance that my mother loves or cares about me"; "I worry about being abandoned or rejected by my mother"). Each statement is rated on a 7-point scale ranging from 1 (*disagree strongly*) to 7 (*agree strongly*). These questions were asked for relationships with mothers, fathers, and friends, however, only adolescent-mother attachment was analyzed in this study given the central importance of mother-child attachment relationships in attachment theory

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[6]   The shorted version with 25 items was used for this study.

(Bowlby, 1973). The CAPAI follows the same structure as Brennan et al.'s (1998) ECR scale (i.e., two-dimensional and continuous measures of attachment styles: attachment avoidance and attachment anxiety). Again, *attachment avoidance* refers to a behavioural strategy where individuals engage in active avoidance to cope with attachment needs, and *attachment anxiety* refers to a behavioural strategy of persistent and often coercive pursuit of others. Those who endorse attachment avoidance have a deactivated attachment system, whereas those who endorse attachment anxiety have a hyperactive attachment system and fear rejection and abandonment.

The CAPAI was administered at two time points, although the data from time one was only utilized for this study. The attachment interviews were administered and coded by independent trained graduate students and research assistants who remained blind to the information in the other module. This measure has excellent psychometric properties (Steiger, 2003). In this study, the internal consistency was acceptable for both attachment avoidance and attachment anxiety (α = .72 & α = .70, respectively).

2.4.2.   Psychopathy Checklist: Youth Version (PCL: YV)

Psychopathic traits were assessed with the PCL: YV (Forth et al., 2003). The PCL: YV is an 18-item rating scale for the assessment of psychopathy in youth aged 12-18, which assesses interpersonal, affective, and overt behaviours. As mentioned above, Cooke and Michie's (2001) three-factor model was used in this study (see Table 1). The personality domains of psychopathy were mostly focused with a specified set of 13 items. In addition to the reasons mentioned previously, the lifestyle facet (Factor 4) was not included in the psychopathy model since there was predictor and criterion overlap (i.e., the items of 'early behaviour problems' and 'poor anger control' in Factor 4 are directly relevant to the rating of CD).

The PCL: YV is similar to the PCL-R (Hare, 1991, 2003), although some items have been modified to reflect adolescent-like characteristics, such as an emphasis on peer, family, and school adjustment during adolescence. The higher an adolescent scores on the PCL: YV, the greater their degree of psychopathy. For the PCL: YV, the manual does not provide a cut-off score for labelling an adolescent as psychopathic; in

fact, it explicitly warns against standardized cut-off scores because of inadequate validity studies to date to establish them (Forth et al., 2003).

Trained graduate students and research assistants who remained blind to the information in the other module rated the presence of each trait through self-report, collateral courses, and the direct observation of the youth through face-to-face interviews. The PCL: YV is scored on a 3-point scale of 0 (*consistently absent*) 1 (*inconsistently present*), and 2 (*consistently present*). Interrater reliability has been consistently moderate in previous validity studies both regarding total scores (ICC: .85 & .70-.90, respectively; Andershed et al., 2008; Vitacco, Neumann, Cadlwell, Leistico, & Van Rybroek, 2006) and factor scores, yet with considerable variability by factor model structure (.22 to .86; Andershed et al., 2008; Flight & Forth, 2007; Vitacco et al., 2006). The PCL: YV manual reports internal consistencies for total scores ranging from .85-.94 across samples. For the three-factor model, the PCL: YV has demonstrated adequate levels of internal consistency (Sevecke et al., 2009). For this study, the internal consistency for the PCL: YV was measured with Cronbachs alpha. All scores were in acceptable range for the total score and Factor 1-3 scores (α = .79, α = .60, α = .65, & α = .59, respectively)[7].

2.4.2.1.   PCL: YV Mean Scores and Intercorrelations

The mean total PCL: YV score across the entire sample was 13.52 (*SD* = 4.47, *Range* = 2-25) for the three-factor model and 20.84 (*SD* = 6.98, *Range* = 4-36) for the four-factor model[8]. Intercorrelations between factor scores of the PCL: YV were significantly: Factor 1 was moderately correlated with Factor 2 (r = .45, *p* < .001), Factor 3 (r = .40, *p* < .001) and strongly correlated with PCL: YV total score (r = .76, *p* < .001); Factor 2 was strongly correlated with Factor 3 (r = .56, *p* < .001) and PCL: YV total score (r = .83, *p* < .001); and Factor 3 was strongly correlated with PCL: YV total score (r = .84, *p* < .001; see Table 4). These moderate to strong inter-factor and factor to total score

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[7]   Using the full sample, the ICC's for total scores and Factors 1-3 were also in the acceptable range (α = .79, α = .63, α = .65, & α = .61, respectively).

[8]   Total score of the four-factor model are given for compariability purposes.

intercorrelations are consistent with most similar PCL: YV research (Salekin et al., 2010).

Table 4. ***Zero-Order Correlations between PCL: YV Factor Scores***

	F1	F2	F3	Total
1. PCL: YV Factor 1 (F1)	--	.449***	.440***	.760***
2. PCL: YV Factor 2 (F2)	--	--	.556***	.828***
3. PCL: YV Factor 3 (F3)	--	--	--	.839***
4. PCL: YV Total (Total)	--	--	--	--

***p* < .001; n = 110.

The zero-order correlations of the PCL: YV factors for the subsample (n = 80) were also analyzed (see Table 5). The participants within this sample had either a childhood- or adolescent-onset CD diagnosis and were selected for the main analyses as opposed to the entire sample (n = 110) since those with no conduct disorder were not of interest for the main analyses, only for preliminary analyses assessing lifetime CD and psychopathy. The strengths of the correlations for the subsample generally are slightly stronger than the complete sample: Factor 1 was moderately correlated with Factor 2 (r = .48, *p* < .001) and Factor 3 (r = .47, *p* < .001), and strongly correlated PCL: YV total score (r = .79, *p* < .001); Factor 2 was strongly correlated with Factor 3 (r = .61, *p* < .001) and PCL: YV total score (r = .84, *p* < .001); and, Factor 3 was strongly correlated with PCL: YV total score (r = .84, *p* < .001).

Table 5. *Zero-Order Correlations between PCL: YV Factor Scores in the Subsample*

	F1	F2	F3	Total
1. PCL: YV Factor 1 (F1)	--	.479***	.467***	.789***
2. PCL: YV Factor 2 (F2)	--	--	.612***	.843***
3. PCL: YV Factor 3 (F3)	--	--	--	.841***
4. PCL: YV Total (Total)	--	--	--	--

***$p < .001$; n = 80.

2.4.3. The Diagnostic Inventory for Children and Adolescents-Revised (DICA-R)

The Diagnostic Interview for Children and Adolescents-Revised (DICA-R; Reich, 2000) is a tool used to map onto DSM-IV diagnoses. The Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association, 2000) distinguishes two subtypes of conduct disorder: childhood-onset and adolescent-onset and as such, the DICA-R also categorizes youth into these two subgroups. To be diagnosed with childhood-onset CD, youth must have had at least one symptom at the age of 9 or younger. For adolescent-onset CD distinction, there must have been an absence of any criteria characteristic of conduct disorder prior to age 10.

Trained graduate students administered the DICA-R, which required approximately 1-2 hours. Each assessment included a criteria based, structured, computer-assisted clinical interview where symptom counts were used to index diagnoses such as conduct disorder, attention deficit hyperactivity disorder, substance dependence disorders, major depressive disorder, and posttraumatic stress disorder. Previous research on the DICA-R reported good validity and test-retest reliability ranging from k=.59 to .92 depending on the disorder being measured (De la Osa, Ezpeleta, Oomenech, Navarro, & Losilla, 1997). De la Osa et al. (1997) found that while internalizing disorders had the highest test-retest reliability compared to externalizing disorders, CD was an exception (k = .92); thus, the test-retest reliability value for CD was very high, unlike the other test-retest reliability coefficients measured for other externalizing disorders.

Lifetime CD and age of onset CD diagnoses were the only variables of interest in this questionnaire. As discussed above, onset age was divided into childhood- and adolescent-onset CD categories.

2.5. Analytical Procedure

To assess the relationships between variables specified in this study's hypotheses, independent samples t-tests, correlation analyses, and moderated multiple regression (MMR) analyses were conducted. First, preliminary independent samples t-test were used to assess the differences between genders and locations. Correlation analyses were then used to examine hypothesized relations among the variables. In order to assess differences between correlations, the Fisher r-to-z Transformation was used. Finally, MMR analyses were used to test for simple main effects and interaction effects of three specific models looking at the main hypotheses (Cohen & Cohen, 2003). The first step in each model controlled for different variables depending on their influence on the dependent variable, which were assessed in preliminary analyses[9]. To test for moderation effects, MMR analyses were conducted in four steps: first, all variables that influenced the dependent variable were controlled for; second, the attachment dimension was entered; third, childhood-onset CD was entered; and the last step involved the two-way interaction term being entered to assess a moderation effect. The criterion variables were the interpersonal (Factor 1), affective (Factor 2), behavioural (Factor 3) dimensions of psychopathy, as well as the PCY: YV total scores. In the exploratory analyses involving gender, correlations were utilized only in order to adequately detect associations. The Fisher r-to-z Transformation was later used to compare associations. Results that were deemed significant following Cohen's (1992) statistical power analysis for all statistical tests.

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[9]   One-way ANOVA's were analyzed for the influence of age, gender, and ethnicity on each of the dependent variables. Significant effects were found for all dependent variables, although they varied for each model. For model 1 (DV: Factor 1), Factors 2 and 3 were controlled for; for model 2 (DV: Factor 2), Factors 1 and 3 were controlled for; for model 3 (DV: Factor 3), Factors 1 and 2, location and age were controlled for. For model 4 (DV: Total Scores) no factors were controlled for.

3.   Results

3.1. Data Preparation

Prior to analysis, all variables in this study were examined for accuracy of data entry and assumptions of both univariate and multivariate analysis (normality, linearity, homoscedasticity, and independence), and while there were moderate levels of skewness in two variables, they did not violate distribution normality criteria to require any transformations. Residuals had straight-line relationships with the predicted dependent variable scores.

To identify outliers, box plots, minimum and maximum values, and standardized scores (z-score) were examined. Factor 1 and attachment anxiety had several cases outside of the whiskers of the box plot, but in all these cases the values were on the end score for both measurements and, therefore, within the normal expectations. These cases were not considered wild values or true outliers. In addition, all z-scores were below Tabachnick and Fidell's (2007) suggested cut-off score of 3.29 for defining non-outliers.

To assess normality, an inspection of skewness, kurtosis, and visual investigation of histograms were conducted. Data were considered to exhibit univariate skew or kurtosis if the statistics equalled or exceeded |2.00| (Miles & Shevlin, 2001). Attachment anxiety and Factor 1 were both positively skewed, indicating that a large proportion of the participants reported experiencing less attachment anxiety and/or less arrogant and deceitful interpersonal style (see Figures A1-A6 for distributions). Attachment anxiety had a severe positive skew (4.90) and Factor 1 had a moderate positive skew (2.79). Even though both variables were skewed as per Miles and Shevlin's (2001) criteria, data was not transformed for the following reasons. First, Tabachnick and Fidell (2001) explicitly caution against transforming data on a widely used measurement; second, the variability present in both attachment anxiety and

Factor 1 were within 1-2 standard deviations of the mean, demonstrating normal variability (refer to Table 3); third, transforming data is not universally recommended because data becomes very difficult to interpret after transformations (Tabachnick & Fidell, 2001). All analyses, therefore, were conducted with original data[10].

The potential presence of multivariate outliers were examined using Mahalanobis' distance. Mahalanobis' distance was calculated for each participant using all the predictor variables and compared them with a critical value of χ^2 distribution. Mahalanbis' distance values for each case were calculated by running a multiple regression with the subject number as the dependent variable, the predictor variables as independent variables, and saving the resulting Mahalanobis' distance for each case as a new variable. Mahalanobis' distance for each variable was then examined using descriptive statistics to see if any of the values were above the critical value, indicating that the case was a multivariate outlier. Critical values were identified by using the χ^2 value at $p < .001$ (df = number of predictor variables included, for this study, 3; Tabachnick & Fidell, 2007). No multivariate outliers were identified. To assess multicollinearity, correlations between predictor variables were analyzed. The predictor variables were not correlated with one another and thus, multicollinearity was not viewed as an issue for this study. Additionally, for the regression models, all independent variables were centered prior to analyses.

3.2. Gender Differences, Sample Contexts, and Other Study Comparisons

Consistent with previous research on attachment (e.g., Bartholomew & Horowitz, 1991; Scharfe, 2002), girls in this sample scored significantly higher attachment anxiety than boys [$t(2, 108) = -2.48$, $p < .05$]. Boys scored significantly higher on Factor 2 [$t(2,

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[10] Due to the debate over transforming skewed data, attachment anxiety was transformed using the log10 transformation for comparability purposes. The analyses did not show any significant differences compared to the analyses with the original scale.

108) = 2.30, $p < .05$] and total scores [$t(2, 108) = 2.30$, $p < .05$] than girls. With the three-factor model, boys scored an average of 14.23 ($SD = 4.32$, $Range = 5\text{-}25$), while girls scored an average of 12.54 ($SD = 4.52$, $Range = 2\text{-}21$) on the total PCL: YV score, when Factor 4 was added, the mean total scores changed to 21.97 ($SD = 6.86$, $Range = 10\text{-}36$) for boys and 19.26 ($SD = 6.91$, $Range = 4\text{-}32$) for girls. As expected regarding early behavioural problems, boys were significantly more likely to have childhood-onset CD than girls ($X^2 = 3.74$, $p < .05$; see Table 6). Consistent with Forth et al. (2003), youth from the forensic setting had significantly higher scores on the PCL: YV than youth from the mental health setting (see Table 7). Significant differences were found for Factor 2 scores [$t(2, 108) = 3.02$, $p < .01$], Factor 3 scores [$t(2, 108) = 5.41$, $p < .001$], and PCL: YV total factor scores [$t(2, 108) = 4.06$, $p < .001$]. The subsample (n=80) did not show any differences across gender on the CAPAI, PCL: YV (individual factors and global score), or DICA-R.

Table 6.   ***Variable Means and Standard Deviations by Gender***

	Boys (*n* = 64)	Girls (*n* = 46)	*t*
	M (SD)	*M (SD)*	
Psychopathy			
PCL: YV Factor 1	3.42 (1.81)	2.98 (1.51)	1.36
PCL: YV Factor 2	4.52 (1.55)	3.72 (2.09)	2.30*
PCL: YV Factor 3	6.30 (2.01)	5.85 (1.92)	1.18
PCL: YV Total	14.23 (4.32)	12.54 (4.52)	1.99*
Attachment Dimensions			
Avoidance	3.03 (1.58)	3.55 (1.96)	-1.54
Anxiety	2.23 (1.28)	2.87 (1.41)	-2.48*
Qualitative Data	Prevalence (%)		X^2
Conduct Disorder			
Childhood-Onset	57.8 (37)	39.1 (18)	3.74*
Adolescent-Onset	20.3 (13)	26.1 (12)	.508
Lifetime CD	21.9 (14)	34.8 (16)	2.25

Note.   Boys had significantly higher mean Factor 2 and PCL: YV total scores than girls, $t(2, 108) = 2.30$, $p = .02$ and $t(2, 108) = 1.99$, $p = .05$, respectively. Girls had significantly higher mean anxiety scores than boys, $t(2,108) = -2.48$, $p = .02$. Boys were significantly more likely to have childhood-onset CD than girls, $X^2 = 3.74$, $p = .05$. *$p < .05$. n= 110.

Table 7.   ***Variable Means and Standard Deviations by Location***

	Forensic[a]	Mental Health[b]	t
	M (*SD*)	*M* (*SD*)	
Quantitative Data			
Psychopathy			
PCL: YV Factor 1	3.44 *(1.98)*	3.04 *(1.35)*	1.24
PCL: YV Factor 2	4.69 *(1.81)*	3.67 *(1.72)*	3.02**
PCL: YV Factor 3	7.02 *(1.88)*	5.20 *(1.64)*	5.41***
PCL: YV Total	15.15 *(4.55)*	11.90 *(3.77)*	4.06***
Attachment Dimensions			
Avoidance	3.28 *(1.75)*	3.22 *(1.79)*	.180
Anxiety	2.55 *(1.45)*	2.45 *(1.30)*	.357
Qualitative Data	**Prevalence (%)**		X^2
Conduct Disorder			
Childhood-Onset	58.2 (32)	41.8 (23)	1.29
Adolescent-Onset	27.3 (15)	18.2 (10)	2.95
Lifetime CD	85.5 (47)	60 (33)	8.98***

Note.   Youth from forensic settings had significantly higher mean Factor 2, Factor 3, and PCL: YV total scores than youth from the mental health setting, $t(2, 108) = 3.02$, $p = .003$; $t(2, 108) = 5.41$, $p = .001$; and $t(2, 108) = 4.06$, $p = .001$, respectively. Youth from forensic settings were significantly more likely to have lifetime conduct disorder than youth from the mental health setting, $X^2 = 8.98$, $p = .003$. [a] $n = 55$, [b] $n = 55$. **$p < .01$, ***$p < .001$; n=110.

3.3. Zero Order Correlations

Zero-order correlations between the independent and dependent variables for the complete sample are presented in Table 8. As previously described in the measures section, the PCL: YV factors were all significantly intercorrelated. Childhood-onset CD had a weak positive significant association with PCL: YV Factor 3 (r = .26 $p < .05$), and PCL: YV total scores (r = .24, $p < .05$). Attachment anxiety had a weak negative significant correlation with Factor 1 (r = -.186, $p < .05$), but no other variables. Attachment avoidance was not significantly associated with any of the main variables.

Table 8.   *Zero-order Correlations between Main Variables*

	1	2	3	4	5	6	7	8
1. PCL: YV Factor 1	--	.449***	.440***	.760***	.168	.098	-.150	-.186*
2. PCL: YV Factor 2	--	--	.556***	.828***	.165	195*	.046	-.034
3. PCL: YV Factor 3	--	--	--	.839***	.256*	.417***	-.085	-.091
4. PCL: YV Total	--	--	--	--	.238*	.302***	-.076	-.125
5. Childhood vs. Late	--	--	--	--	--	N/Aᵃ	-.140	-.143
6. Lifetime CD	--	--	--	--	N/Aᵃ	--	.052	-.030
7. Mother Avoidance	--	--	--	--	--	--	--	.005
8. Mother Anxiety	--	--	--	--	--	--	--	--

ᵃ Cannot be computed because at least one variable is constant.
*$p < .05$, **$p < .01$, *** $p < .001$; n = 110.

3.4. Replications of Previous Findings

As predicted in previous studies discussed above, both total and certain individual factor PCL: YV scores had significant positive associations with lifetime CD (see Table 9). Factor 2, Factor 3, and PCL: YV total scores had a significantly positive relationship with lifetime CD ($r = .30$, $p < .001$; $r = .20$, $p < .05$; & $r = .42$, $p < .001$, respectively). In contrast Factor 1, though, had a very weak correlation with lifetime CD ($r = .10$, $p = .62$). Because of the significant intercorrelations between factors, partial correlations were conducted to assess the unique contribution between each factor and lifetime CD. Again, consistent with previous research (Burke et al., 2007), once the other factors were controlled for, Factor 2 was not significantly associated with lifetime CD ($r = -.02$, $p = .83$) while Factor 1 remained non-significant ($r = -.01$, $p = .32$). Only Factor 3 remained significant, with a moderately positive association ($r = .39$, $p < .001$).

Table 9.   ***Relationship between Psychopathy and Lifetime Conduct Disorder***

	Point-Biserial Correlation (n = 110)	Partial Correlation (n = 106)
1. PCL: YV Factor 1	.098	-.096
2. PCL: YV Factor 2	.195*	-.021
3. PCL: YV Factor 3	.417***	.389***
4. PCL: YV Total	.302***	--

*p < .05, ***p < .001.

        The strength of associations between attachment dimensions and psychopathy facets between boys and girls were analyzed for the overall sample and the subsample by looking at the partial correlations (see Tables 10-13). Gender trends were evident; additionally, Fisher r-to-z Transformation revealed a significant gender difference for attachment anxiety and the behavioural facet. In the overall sample (see Tables 10 & 11), girls had a much stronger positive association though only with marginal statistical significance between attachment anxiety and affective facet (r = .28, *p* = .07) than the weak and non-significant correlation found for boys (r = .07, *p* = .59). This pattern was evident also regarding attachment anxiety and the behavioural facet; girls had a much stronger significant negative association (r= -.33, *p* = .03) than the weak positive and non-significant correlation (r = .13, *p* = .30) found for boys [Z = 2.28, *p* = .02]. In sharp contrast, though, for attachment avoidance and the affective facet central to psychopathy, boys had much stronger positive and statistically significant association (r = .40, *p* = .001) than the weak and non-significant association for girls (r = .07, *p* = .644). However, these gender differences were not evident in the subsample (see Tables 12 & 13).

Table 10.   ***Zero-order Correlations between PCL:YV Scores and Attachment for Boys***

	PCL: YV Factor 1	PCL: YV Factor 2	PCL: YV Factor 3	PCL: YV Total
Attachment Avoidance	-.036 (-.230)	.331*(.398**)	.060 (-.027)	.132
Attachment Anxiety	-.162 (-.227)	.013 (.071)	.064 (.134)	-.033

Note.   Bivariate correlations are presented first, followed by partial correlations controlling for other factors (n = 64, n = 60, respectively). *p < .01, ** p < .001.

Table 11.   *Zero-order Correlations between PCL: YV Scores and Attachment for Girls*

	PCL: YV Factor 1	PCL: YV Factor 2	PCL: YV Factor 3	PCL: YV Total
Attachment Avoidance	-.270 (-.214)	-.129 (.072)	-.225 (-.151)	-.246
Attachment Anxiety	-.166 (.134)	.021 (.280)	-.242 (-.326*)	-.146

Note.   Bivariate correlations are presented first, followed by partial correlations controlling for other factors (n = 46, n = 42, respectively). *p < .05.

Table 12.   *Zero-order Correlations between PCL: YV Scores and Attachment for Boys in Subsample*

	PCL: YV Factor 1	PCL: YV Factor 2	PCL: YV Factor 3	PCL: YV Total
Attachment Avoidance	-.036 (-.230)	.331*(.398**)	.060 (-.027)	.132
Attachment Anxiety	-.162 (-.227)	.013 (.071)	.064 (.134)	-.033

Note.   Bivariate correlations are presented first, followed by partial correlations controlling for other factors (n = 50, n = 46, respectively). *p < .05, **p < .01.

Table 13.   *Zero-order Correlations between PCL: YV Scores and Attachment for Girls in Subsample*

	PCL: YV Factor 1	PCL: YV Factor 2	PCL: YV Factor 3	PCL: YV Total
Attachment Avoidance	-.066 (-.258)	.292* (.378)**	.077 (-.056)	.106
Attachment Anxiety	-.155 (-.183)	-.009 (.066)	-.018 (.038)	-.077

Note.   Bivariate correlations are presented first, followed by partial correlations controlling for other factors (n = 30, n = 26, respectively). *p < .05, **p < .01.

Differences in association between factor scores based on CD-onset developmental stage are reported in Tables 14 and 15. Childhood-onset CD had significantly higher mean Factor 3 and total scores [$t(2, 78) = 2.34$, $p = .02$] than youth with adolescent-onset CD [$t(2, 78) = 2.17$, $p = .03$]. Results showed that boys and girls did not significantly differ based on CD-onset (see Table 15). Regarding within gender differences and PCL: YV scores by CD, girls with childhood-onset CD had significantly higher mean Factor 2 scores [$t(28) = 2.14$, $p = .04$], Factor 3 scores [$t(28) = 2.84$, $p = .01$], and total factor scores [$t(28) = 2.26$, $p = .03$] than girls with adolescent-onset CD.

However, no significant differences in PCL: YV scores were evident for boys with childhood-onset CD versus adolescent-onset CD (refer to Table 15).

Table 14. *PCL: YV Scores by Conduct Disorder for the Subsample*

PCL: YV Factor Levels	M *(SD)*	Range
PCL: YV Factor 1		
Childhood-Onset[a]	3.55 *(1.88)*	0-8
Adolescent-Onset[b]	2.88 *(1.72)*	0-8
PCL: YV Factor 2		
Childhood-Onset	4.60 *(1.76)*	0-8
Adolescent-Onset	3.96 *(1.86)*	0-8
PCL: YV Factor 3		
Childhood-Onset	6.93 *(1.72)*	3-10
Adolescent-Onset	5.92 *(1.93)*	3-10
PCL: YV Total		
Childhood-Onset	15.07 *(4.36)*	4-23
Adolescent-Onset	12.76 *(4.57)*	5-25

Note.   Youth with childhood-onset CD had significantly higher mean Factor 3 scores and PCL: YV total scores than youth with adolescent-onset CD, $t(2, 78) = 2.34$, $p = .02$ and $t(2, 78) = 2.17$, $p = .03$, respectively. n = 55[a], n = 25[b].

Table 15. **PCL: YV Scores by Conduct Disorder and Gender for the Subsample**

PCL: YV Factor Levels	Boys M *(SD)*	Girls M *(SD)*
PCL: YV Factor 1		
Childhood-Onset	3.76 *(1.98)*	3.11 *(1.64)*
Adolescent-Onset	2.85 *(1.99)*	2.92 *(1.44)*
PCL: YV Factor 2		
Childhood-Onset	4.46 *(1.57)*	4.89 *(2.11)*
Adolescent-Onset	4.54 *(1.86)*	3.33 *(1.67)*
PCL: YV Factor 3		
Childhood-Onset	6.84 *(1.80)*	7.11 *(1.57)*
Adolescent-Onset	6.31 *(2.29)*	5.50 *(1.45)*
PCL: YV Total		
Childhood-Onset	15.05 *(4.47)*	15.11 *(4.24)*
Adolescent-Onset	13.69 *(5.30)*	11.75 *(3.57)*

Note. There were no significant differences between boys and girls. Girls with childhood-onset conduct disorder had significantly higher mean Factor 2, Factor 3 and PCL: YV total scores than girls with adolescent-onset conduct disorder, $t(2, 28) = 2.14$, $p = .04$, $t(2, 28) = 2.84$, $p = .01$, and $t(2, 28) = 2.26$, $p = .03$, respectively. n = 37 (childhood- onset boys), n = 13 (adolescent-onset boys), n=18 (childhood-onset girls), n=12 (adolescent-onset girls).

3.5. Attachment, Conduct Disorder, and Psychopathy

Bivariate relationships between attachment avoidance and PCL: YV Factors 1-3 and PCL: YV total scores are presented in Table 16. After controlling for other factors, a statistically significant though weak positive association occurred between Factor 2 and attachment avoidance ($r = .25$, $p < .05$). None of the factors were associated with attachment anxiety, even after each factor was controlled for (see Table 17). When childhood-onset and adolescent-onset CD were considered for attachment avoidance, the correlations between Factor 2 and attachment avoidance showed significant differences; childhood-onset CD youth had a moderate positive relationship (r = .43, *p* <.001), while adolescent-onset CD youth did not show an association (see Table 18). It should also be noted that a significant negative relationship between Factor 1 and

attachment avoidance was also found (r = -.30, *p* <.05). These contrasting correlations will be further discussed in the discussion section.

Table 16.   *Relationship between Psychopathy and Attachment Avoidance*

	Bivariate Correlation (*n* = 80)	Partial Correlation (*n* = 76)
1. PCL: YV Factor 1	-.157	-.213
2. PCL: YV Factor 2	.120	.252*
3. PCL: YV Factor 3	-.061	-.117
4. PCL: YV Factor Total	-.041	--

*p < .05; n=80.

Table 17.   *Relationship between Psychopathy and Attachment Anxiety*

	Bivariate Correlation (*n* = 80)	Partial Correlation (*n* = 76)
1. PCL: YV Factor 1	-.143	-.134
2. PCL: YV Factor 2	-.032	.063
3. PCL: YV Factor 3	-.088	-.050
4. PCL: YV Factor Total	-.109	--

n = 80.

Table 18.   *Relationship between Psychopathy and Attachment Avoidance by CD-onset*

	Bivariate Correlation (*n* = 55/25)	Partial Correlation (*n* = 51/21)
1. PCL: YV Factor 1	-.153/-.101	-.304*/-.036
2. PCL: YV Factor 2	.291*/-.136	.433***/-.090
3. PCL: YV Factor 3	.007/-.089	-.176/-.002
4. PCL: YV Factor Total	.054/-.131	--/--

Note.   Childhood-onset bivariate correlations are presented first, followed by adolescent-onset bivariate correlations. *p < .05, ***p <.001.

A series of independent MMR analyses were conducted to test the association between attachment avoidance to each of the dependent variables: interpersonal facet, affective facet, behavioural facet, and total PCL: YV scores. These analyses also tested for potential interaction effects of childhood-onset CD with attachment in predicting PCL: YV factors scores. Since assessing the unique contribution of each factor was a main priority for this study, the two other additional factors were controlled for in step 1 of each regression model. The relationships between attachment avoidance and PCL: YV Factors 1-3 scores are presented in Tables 20-22 and Figures 2-5. Table 19 shows the bivariate correlations between factor scores and attachment dimensions separately for childhood-onset CD and adolescent-onset CD youth.

Table 19. **Zero-order Correlations between PCL: YV Scores and Attachment**

	1	2	3	4	5	6
1. PCL: YV Factor 1	--	.453**	.413**	.778***	-.153	-.120
2. PCL: YV Factor 2	.495**	--	.614***	.842***	.291*	-.043
3. PCL: YV Factor 3	.524**	.567**	--	.821***	.007	-.124
4. PCL: YV Total	.799***	.833***	.851***	--	.054	-.119
5. Mother Avoidance	-.101	-.136	-.089	-.131	--	-.084
6. Mother Anxiety	-.143	.060	.083	.006	.012	--

Note.   Top diagonal is childhood-onset, bottom diagonal is adolescent-onset. *$p < .05$, **$p < .01$, *** $p < .001$. n=80.

3.5.1.   *Moderation Models*

Figure 1.   **Relationship between Attachment Avoidance, Conduct Disorder, and Psychopathy**
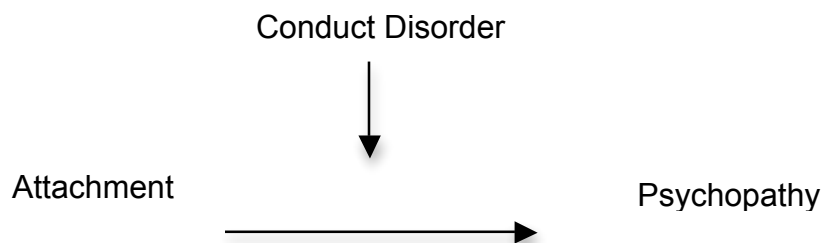
3.5.1.1. PCL:YV Factor 1 and Attachment Avoidance

Attachment avoidance was not positively related to Factor 1 scores (Step 2: β = -.19, p = .06; see Table 20). Childhood-onset CD was also unrelated to Factor 1 scores (Step 3: β = .10, p = .81). No significant interaction was observed between childhood-onset CD and attachment avoidance in predicting Factor 1 scores in the final step (Step 5: β = -.12, p = .22; see Figure 2). It should be noted that against our hypothesis, the interpersonal facet showed a negative relationship with attachment avoidance, which will be further addressed in the discussion section.

Table 20. ***Regression Examining the Relation between Attachment Avoidance, Childhood-Onset Conduct Disorder, and PCL: YV Factor 1 Scores***

	B (S.E)	B	t	p
Step 1				
Factor 2	.316 (.125)	.308	2.52	.014
Factor 3	.280 (.123)	.279	2.28	.032
Step 2				
Factor 2	.364 (.126)	.355	2.89	.005
Factor 3	.240 (.123)	.239	1.95	.055
Avoidance	-.187 (.099)	-.185	-1.90	.061
Step 3				
Factor 2	.363 (.127)	.354	2.86	.005
Factor 3	.235 (.126)	.233	1.87	.066
Avoidance	-.184 (.100)	-.182	-1.84	.070
Childhood-onset	.096 (.396)	.024	.243	.808
Step 4				
Factor 2	.398 (.130)	.389	3.07	.003
Factor 3	.219 (.126)	.218	1.74	.086
Avoidance	-.198 (.100)	-.195	-1.97	.052
Childhood-onset	.136 (.396)	.034	.342	.733
Avoidance X Childhood-onset	-.262 (.211)	-.123	-1.24	.219

Note. n = 80.

Figure 2. ***Attachment Avoidance and Onset of Conduct Disorder in Relation to PCL: YV Factor 1 Scores***
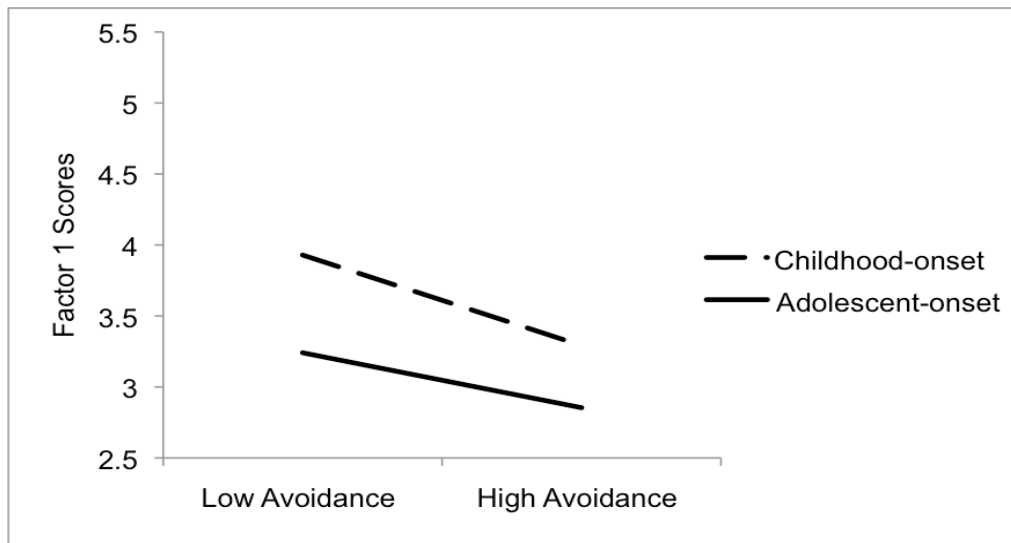
3.5.1.2. PCL: YV Factor 2 and Attachment Avoidance

As indicated in Step 2, attachment avoidance was significantly, but weakly related to Factor 2 scores ($R^2\Delta$ = .037, β = .19, p = .03). There was no direct association between childhood-onset CD and Factor 2 after controlling for the other factors and attachment avoidance (Step 3), while Step 4 showed a significant but weak childhood-onset CD by avoidance interaction ($R^2\Delta$ = .035, β = .19, p = .03). The overall model was significant ($F(5, 74)$ = 14.49, $p < .001$; R^2 = .50) and the last step was significant (FΔ = 5.16, p = .03). A model was done without controlling for the other factors scores to get the correct overall model explained variance; results showed that 9% of the variability in deficient affective features were predicted by attachment avoidance and childhood-onset CD ($F(3, 77)$ = 7.56, $p < .067$; R^2 = .09), which is a medium effect size (Cohen, 1992).

As revealed in Figure 3, the interaction between avoidance and childhood-onset CD, and the positive relationship between attachment avoidance and Factor 2 scores indicated that youth with childhood-onset CD had a higher likelihood of attachment avoidance and a higher likelihood of more affective deficits than those youth with adolescent-onset CD and high attachment avoidance.

Table 21. **Regression Examining the Relation between Attachment Avoidance, Childhood-Onset Conduct Disorder, and PCL: YV Factor 2 Scores**

	B (S.E)	B	t	p
Step 1				
Factor 1	.241 (.096)	.247	2.52	.014
Factor 3	.488 (.096)	.497	5.07	.011
Step 2				
Factor 1	.272 (.094)	.279	2.89	.005
Factor 3	.485 (.094)	.494	5.17	.001
Avoidance	.192 (.084)	.194	2.27	.026
Step 3				
Factor 1	.271 (.095)	.278	2.86	.005
Factor 3	.480 (.096)	.489	4.98	.001
Avoidance	.194 (.086)	.197	2.27	.027
Childhood-onset	.082 (.343)	.019	.240	.811
Step 4				
Factor 1	.284 (.092)	.291	3.07	.003
Factor 3	.465 (.094)	.474	4.95	.001
Avoidance	.208 (.083)	.210	2.49	.015
Childhood-onset	.015 (.335)	.004	.045	.964
Avoidance X Childhood-onset	.395 (.174)	.190	2.27	.026

Note. $n = 80$.

Figure 3. *Moderation Effect – Attachment Avoidance and Onset of Conduct Disorder in Relation to PCL: YV Factor 2 Scores*
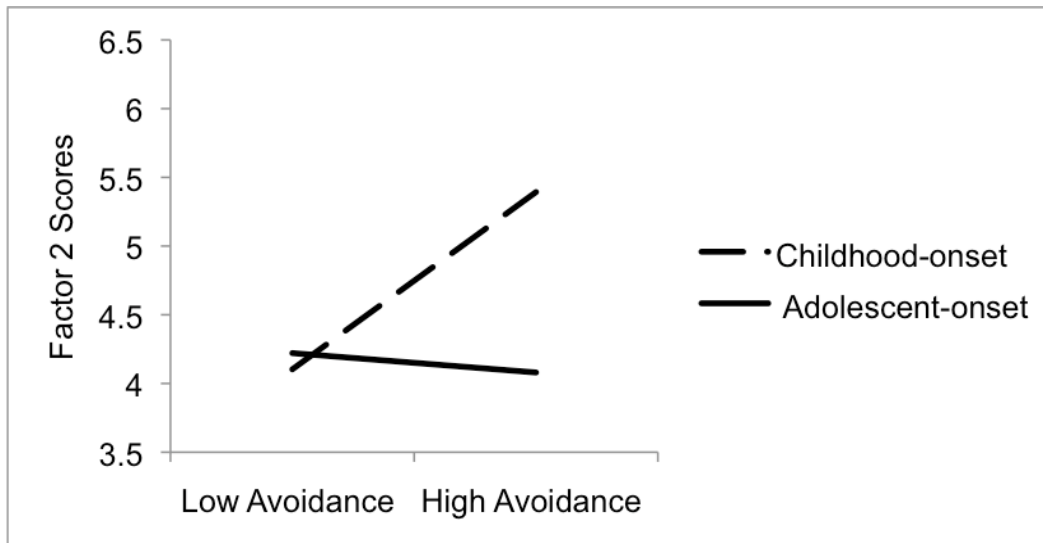
3.5.1.3.   PCL: YV Factor 3 and Attachment Avoidance

There was no observed association between attachment avoidance and Factor 3, controlling for the other factors (see Table 22). Attachment avoidance did not contribute to the overall model (Step 2: β = -.08, *p* = .34), in addition to childhood-onset CD (Step 3: β = .14, *p* = .10). Further, Step 5 revealed no childhood-onset CD by attachment avoidance interaction (β = -.04, *p* = .62). As outlined in Figure 4 there was no relationship between attachment avoidance and CD-onset in relation to the behavioural traits of psychopathy (i.e., childhood-onset CD youth scored higher than adolescent-onset CD youth on Factor 3, regardless of being low or high on attachment avoidance).

Table 22.   ***Regression Examining the Relation between Attachment Avoidance,***
Childhood-Onset Conduct Disorder, and PCL: YV Factor 3 Scores

	B (S.E)	B	t	p
Step 1				
Factor 1	.244 (.093)	.246	2.62	.011
Factor 2	.423 (.100)	.415	4.24	.001
Location	-.761 (.382)	-.205	-2.00	.050
Age	.158 (.125)	.125	1.26	.211
Step 2				
Factor 1	.220 (.097)	.221	2.28	.026
Factor 2	.449 (.103)	.441	4.34	.001
Location	-.691 (.389)	-.186	-1.78	.080
Age	.178 (.127)	.141	1.41	.163
Avoidance	-.085 (.088)	-.084	-.97	.338
Step 3				
Factor 1	.212 (.096)	.213	2.21	.030
Factor 2	.422 (.103)	.541	4.08	.001
Location	-.770 (.387)	-.208	-.199	.050
Age	.158 (.126)	.125	1.25	.214
Avoidance	-.060 (.088)	-.060	-.685	.495
Childhood-onset	.556 (.332)	.141	1.67	.099
Step 4				
Factor 1	.204 (.097)	.205	2.10	.036
Factor 2	.435 (.107)	.427	4.06	.001
Location	-.780 (.390)	-.210	-2.00	.049
Age	.152 (.127)	.120	1.19	.237
Avoidance	-.065 (.089)	-.065	-.734	.465
Childhood-onset	.570 (.335)	.145	1.70	.094
Avoidance X Childhood-onset	-.091 (.182)	-.043	-.503	.616

Note.   n = 80.

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Figure 4. *Attachment Avoidance and Onset of Conduct Disorder in Relation to PCL: YV Factor 3 Scores*
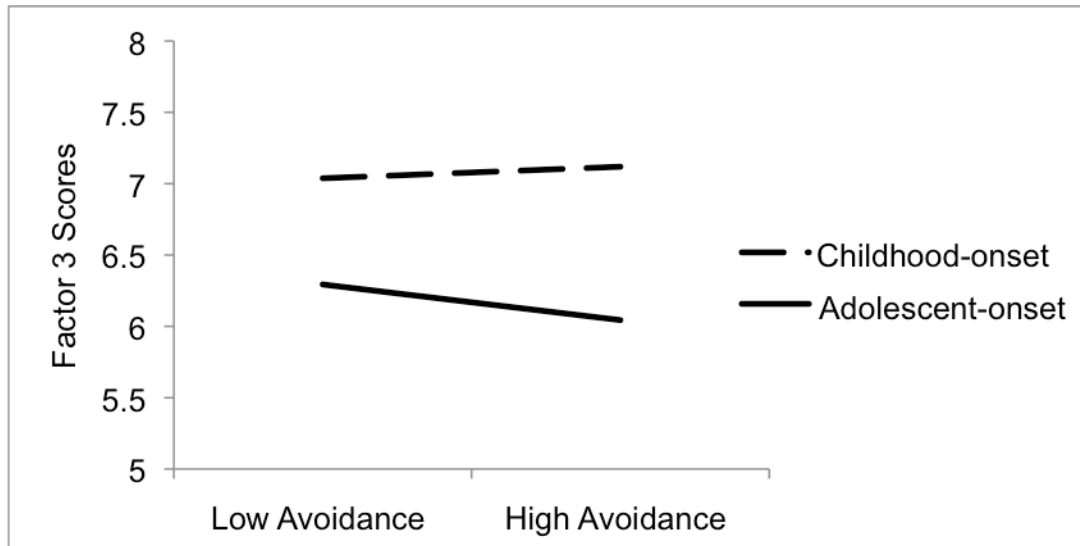

3.5.1.4. PCL:YV Total and Attachment Avoidance

No variables were controlled for in this model. Step 1 showed that attachment avoidance was not related to PCL: YV total scores, although childhood-onset CD had a weak but significant positive relationship to PCL: YV total scores (Step 2: $R^2\Delta$ = .055, β = .237, p = .04). In addition, there was no interaction between attachment avoidance and childhood-onset CD (Step 4; see Figure 5).

Table 23. **Regression Examining the Relation between Attachment Avoidance, Childhood-Onset Conduct Disorder, and PCL: YV Total Scores**

	B (S.E)	B	t	p
Step 1				
Avoidance	-.102 (.280)	-.041	-.363	.717
Step 2				
Avoidance	-.020 (.277)	-.008	-.072	.943
Childhood-onset	2.32 (1.08)	.237	2.12	.037
Step 3				
Avoidance	-.006 (.278)	-.002	-.022	.983
Childhood-onset	2.22 (1.09)	.229	2.03	.046
Avoidance X Childhood-onset	.443 (.585)	.085	.758	.451

Note. $n = 80$.

Figure 5. **Attachment Avoidance and Onset of Conduct Disorder in Relation to PCL: YV Total Scores**
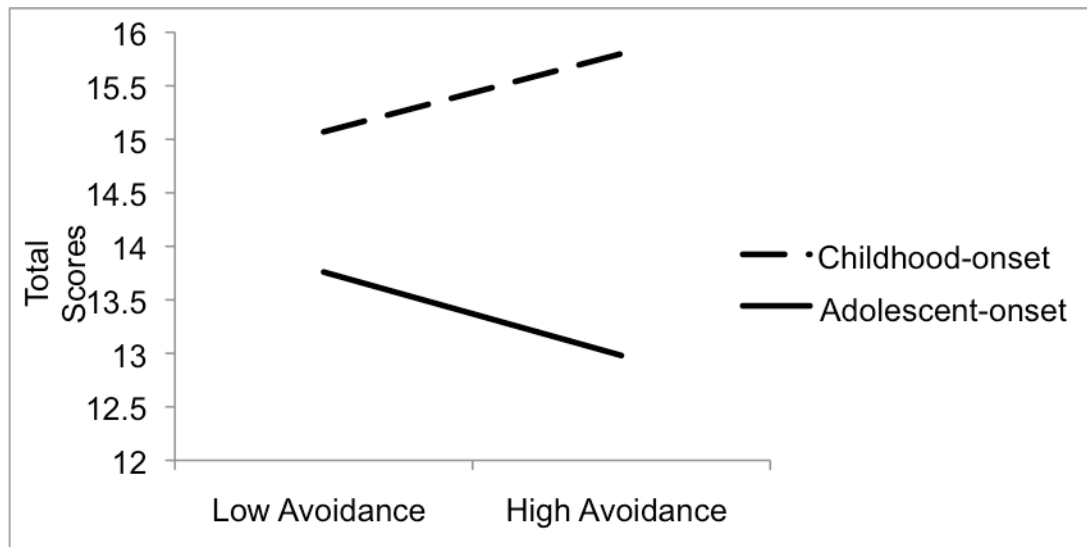
3.5.2. Exploratory Analyses

In order to further explore the relationships between attachment avoidance, CD-onset, and psychopathy factors, boys and girls were analyzed separately using bivariate correlations and then Fisher-r-to-z Transformations to detect gender differences and/or

trends. Regression models would have been preferable, but given the extremely small sample sizes by gender based on childhood- versus adolescent-onset CD, bivariate analyses were more appropriate. Additionally, due to the exploratory nature of these analyses, adolescents with no CD were included in the analyses for comparison purposes.

The association between attachment avoidance and psychopathy factors varied depending on CD-onset for boys and girls (see Tables 24 & 25). There was a moderate significant relationship between attachment avoidance and Factor 2 for boys ($r = .35$, $p < .05$) and, when Factors 1 and 3 were controlled for, this relationship became stronger ($r = .46$, $p < .001$). Boys with no CD also had a significant association between attachment avoidance and Factor 2 scores ($r = .67$, $p < .01$) and, again, when Factors 1 and 3 were controlled for, this association was still significant ($r = .66$, $p < .05$). However the non-significant relationship between adolescent-onset CD boys and Factor 2 when Factors 1 and 3 were controlled for, possibly resulted from the small sample size (n = 9). No significant differences were found between CD-onset using the Fisher-r-to-z transformation. Very importantly, though, these results suggested that CD-onset for boys possibly had a lesser effect on the association between attachment avoidance and lack of affect. The implications of this finding will be addressed further in the discussion section.

Table 24.   *Relationship between Psychopathy and Attachment Avoidance in Boys*

	Bivariate Correlation	Partial Correlation
PCL: YV Factor 1		
Childhood-Onset[a]	-.072	-.282
Adolescent-Onset[b]	-.057	-.234
No CD[c]	.202	.143
PCL: YV Factor 2		
Childhood-Onset	.354*	.463**
Adolescent-Onset	.153	.234
No CD	.668**	.660*
PCL: YV Factor 3		
Childhood-Onset	.072	-.141
Adolescent-Onset	.086	.065
No CD	-.321	-.296
PCL: YV Total		
Childhood-Onset	.122	--
Adolescent-Onset	.071	--
No CD	.211	--

Note. $*p < .05$, $**p < .01$; $n^a = 37$, $n^b = 13$, $n^c = 14$.

For girls, only those with childhood-onset CD had a significantly strong association between attachment avoidance and Factor 2 scores ($r = .55$, $p < .05$), after Factors 1 and 3 were controlled for (see Table 25). Additionally, girls also had a significantly strong *negative* association between attachment avoidance and Factor 1 scores ($r = -.53$, $p < .05$), after Factors 2 and 3 were controlled for. The Fisher r-to-z Transformation was conducted to detect any significant differences between these correlations; girls with childhood-onset CD had significantly higher scores than girls with no CD [$Z=2.08$, $p < .05$]. Additionally, while Factor 2 scores for childhood-onset CD youth compared to adolescent-onset CD youth were different, they were not significant [$Z=1.49$, $p = .14$]. Nonetheless, girls with adolescent-onset CD or no CD had *less* attachment avoidance and associated *lower* Factor 2 scores. There were no significant differences between CD-onset and Factor 1 scores.

Table 25.   ***Relationship between Psychopathy and Attachment Avoidance in Girls***

	Bivariate Correlation	Partial Correlation
PCL: YV Factor 1		
Childhood-Onset[a]	-.333	-.529*
Adolescent-Onset[b]	-.197	-.108
No CD[c]	-.235	-.063
PCL: YV Factor 2		
Childhood-Onset	.213	.554*
Adolescent-Onset	-.251	-.175
No CD	-.414	-.303
PCL: YV Factor 3		
Childhood-Onset	-.122	-.391
Adolescent-Onset	-.201	-.037
No CD	-.300	-.043
PCL: YV Total		
Childhood-Onset	-.068	--
Adolescent-Onset	-.278	--
No CD	-.390	--

Note.   *$p < .05$. $n^a = 18$, $n^b = 12$, $n^c = 16$. Fisher r-to-z Transformation showed that Factor 2 (partial) scores were higher for childhood-onset youth compared to adolescent-onset youth, $z = 1.49$, $p = .14$ and significantly higher for childhood-onset youth compared to youth without conduct disorder, $z = 2.08$, $p = .04$.

There were no significant differences between gender based on CD-onset, except between boys and girls with no CD. Fisher r-to-z Transformation showed that boys had a significantly stronger relationship between attachment avoidance and affective traits compared to girls [$Z = 2.70$, $p = .03$].

3.6. Summary of Results

Several significant and small to moderate relationships between attachment avoidance and psychopathy factors were evident. Importantly, a bivariate correlation showed an association between attachment avoidance and the affective facet of the PCL: YV ($r = .25$, $p < .05$), although a much stronger association emerged when only

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childhood-onset CD youth were analyzed (r = .43, p < .001). Also regarding the affective facet on the PCL: YV, there was both a significant interaction between childhood-onset CD and attachment avoidance ($R^2\Delta$ = .035, β = .19, p = .03), and exploratory analyses revealed different relationships by gender. Girls with childhood-onset CD had a significant association between attachment avoidance and the affective facet (r = .55, p < .05) while boys with childhood-onset CD (r = .46, p < .001) and no CD (r = .66, p < .05) both had significant associations between attachment avoidance and the affective facet. These results confirmed the importance of the unique contribution of the affective facet on the PCL: YV and attachment to mothers during adolescence.

Finally, the absence of significant relationships with attachment and total PCL: YV scores suggested that it is important to consider the specific psychopathy factors rather just total scores when examining the theoretical relevance of attachment styles. As discussed above, the results support the perspective that affective deficits are at the core of psychopathy construct.

4.   Discussion

Similar to adults, psychopathic characteristics in adolescents have been associated with negative life outcomes, such as overall frequency and severity of violent criminal offending and past and future antisocial behaviour (Gretton et al., 2004; Skeem et al., 2003). Thus, identifying what factors play a role in the expression of psychopathy and how these factors associate with the individual dimensions or traits is important, especially from a developmental perspective. This study extended past research concerning the relationship between attachment and psychopathy by exploring *attachment dimensions* as well as the moderating role of childhood-onset CD, which were both hypothesized to be important determiners in the expression of psychopathy. First, it was predicted that adolescents scoring higher on the PCL: YV were likely to exhibit more avoidant attachment styles and less attachment anxiety. Second, based on the well-established relationship between early behavioural disturbances and adverse adolescent/adult outcomes, childhood-onset CD was predicted to increase the association between attachment avoidance and psychopathy. In addition, exploratory analyses were conducted to assess gender differences between attachment avoidance and psychopathy traits related to the two CD-onset periods. As previously stated, the full sample was necessary to utilize for preliminary analyses but the subsample was also used in some preliminary descriptive analyses for comparability purposes. As for the main analyses (hypothesis 1-4), only the subsample was used and therefore, will only be described.

Regarding the study hypotheses, hypothesis 1 was partially supported; only the affective facet showed a moderate positive relationship with attachment avoidance. Hypothesis 2 was not supported; no relationships were found between attachment anxiety and psychopathy factors. Hypothesis 3 was partially supported; results showed that there was a significant interaction between attachment avoidance and childhood-onset CD on the affective facet of psychopathy, but not the interpersonal or behavioural facets. Childhood-onset CD was associated with avoidant attachment styles, and higher

affective traits. With regard to the exploratory gender question: girls with childhood-onset CD had a strong positive association between attachment avoidance and the affective facet of psychopathy, whereas boys with childhood-onset and no CD had a strong positive association between attachment avoidance and the affective facet. Childhood-onset girls also showed a strong negative association between attachment avoidance and the interpersonal facet. Therefore, girls did not have poorer outcomes (i.e., stronger relationships between attachment avoidance and psychopathy factors) than boys with childhood-onset CD, although they did have poorer outcomes than girls with adolescent-onset CD and significantly poorer outcomes than girls with no CD on the affective facet of psychopathy.

4.1. Attachment

This study used a two-dimensional, continuous measure of attachment style similar to the ECR validity studies (Brennan et al., 1998). Consistent with this research, the average rating for attachment avoidance was 3.25 (*SD* =1.76, *Range* = 1-7) and 2.50 (*SD* = 1.37, *Range* = 1-6) for attachment anxiety. Frequency tests showed a positive skew for attachment anxiety (less attachment anxiety) and a normal distribution for attachment avoidance (see Figures A5 & A6). Furthermore, and, again, consistent with the literature (e.g., Bartholomew & Horowitz, 1991; Scharfe, 2002), there were attachment related gender differences; girls were significantly more likely to report attachment anxiety than boys. However, there were no significant gender differences in attachment avoidance, although girls had slightly higher mean scores than boys (3.55 vs. 3.03). Regarding the mean level of attachment avoidance, past research has shown the opposite, with boys showing more attachment avoidance than girls (Bartholomew & Horowitz, 1991). This demonstrated that girls in this sample had higher attachment insecurity, with higher attachment anxiety and attachment avoidance. The significant differences present in attachment anxiety between boys and girls might have resulted from one or both of the following sources: socialization practices that lead girls to value relationships more than boys (Ma & Huebner, 2008; Zahn-Waxler et al., 2008) or biological differences between genders (Beech & Mitchell, 2005). As for the subsample, attachment dimensions did not differ for boys and girls. This indicates that for the highest at-risk youth, gender does not seem to play as big of a role with regards to the

prototypical attachment styles based on gender (i.e., attachment anxiety for girls and attachment avoidance for boys; Bartholomew & Horowitz, 1991). This finding should be explored further given that this goes against past literature on attachment dimensions with respect to gender.

Unlike community samples where secure attachment predominates (Bartholomew & Horowitz, 1991), attachment insecurity was high in the entire sample. The high rate of attachment insecurity is consistent with previous research in adolescent clinical samples (e.g., Scharfe, 2002). Attachment dimensions did not significantly differ based on sample location (forensic vs. community) for both the full sample and subsample.

4.2. Psychopathic Characteristics

While the three-factor model was further substantiated in this study, the four-factor total scores were also reported for comparability purposes; the average scores for the three-factor and four-factor models were 13.53 (*SD* = 4.47, *Range* = 2-25) and 20.84 (*SD* = 6.98*, Range* = 4-36), respectively. These results were consistent with previous PCL: YV research (Flight & Forth, 2007; Forth et al., 2003; Kosson et al., 2002).

As expected, with the full sample, there were statistically significant gender differences in psychopathy, with girls scoring two points lower than boys on their total scores and almost one point lower on the affective facet. Total scores varied from the PCL: YV manual, where Forth et al. (2003) reported less than a one-point difference between gender. Additionally, in this study there were the anticipated significant differences in psychopathy scores in the forensic and community settings (Forth et al., 2003): youth from the forensic settings had significantly higher mean affective, behavioural, and total scores than the youth from the mental health settings; however, interpersonal facet score (glibness and superficial charm) was not significantly different. The largest difference was in the behavioural facet score (impulsivity and irresponsibility) of psychopathy, which further confirmed that higher antisocial tendencies were more prevalent among incarcerated youth, as would be expected. When the subsample was analyzed, there were surprisingly no location or gender differences in psychopathy

scores, showing that in behavioural disturbed (opposed to those without a CD diagnosis), boys and girls seem to become more similar in their levels of severity with respect to psychopathy.

4.3. The Relation of Onset and Psychopathy

Past research has shown that CD is associated with psychopathy (Forth & Book, 2010; Kosson et al., 2002). Not surprisingly, therefore, the affective facet, behavioural facet, and total scores were significantly associated with lifetime CD. However, when other factors were controlled for, only the behavioural facet remained significant. Nonetheless, this pattern confirmed previous findings that indicated that only a small-proportion of conduct disordered youth display the callous and unemotional traits associated with psychopathy (Frick, 2002; Salekin, 2006; Salekin & Frick, 2005). In other words, it was not unexpected that the behavioural facet was only highly correlated with lifetime CD, while the traditional personality dimensions had weaker associations.

While lifetime CD did not have a strong association with the personality features of psychopathy, when important developmental distinctions (childhood- and adolescent-onset CD) were considered, the associations between CD and psychopathy changed; youth with childhood-onset CD had significantly higher behavioural scores and total scores compared to youth with adolescent-onset CD. From a developmental theoretical perspective, this pattern supported the long standing contention that childhood-onset CD youth have more antisocial life course dispositional vulnerabilities than adolescent-onset CD youth including more severe aggressive acts during adolescence (Dandreaux & Frick, 2009; Moffitt, 1993, 2003). While gender differences were expected based on the gender paradox (theoretically psychopathy could be seen as a more severe form of CD, with the inclusion of a personality dimension), somewhat surprising, no gender differences were found between boys and girls with CD in relation to psychopathy scores (i.e., girls with CD did not have higher psychopathy scores compared to boys with CD). Additionally, within gender, boys with childhood-onset CD did not have significantly higher scores on the PCL: YV compared to boys adolescent-onset CD, which was surprising given the vast array of research confirming developmental pathway differences based on CD-onset (Moffitt, 1993, 2006). Nonetheless, boys with childhood-

onset CD still had higher psychopathy scores than adolescent-onset CD, the difference was neither substantial nor significant in contrast to the girls. Girls with childhood-onset CD had significantly higher affective, behavioural, and total scores than girls with adolescent-onset CD. These results support past research showing that girls with childhood-onset are worse off than girls with adolescent-onset, similar to the developmental pathway of boys (Dandreaux & Frick, 2009; Sliverthorn et al., 2001). Thus, it was not unexpected that childhood-onset CD girls had more affective and behavioural features of psychopathy than adolescent-onset CD girls. In effect, these results indicted that girls with childhood-onset CD were likely to have more intensive problems or antisocial vulnerabilities than childhood-onset CD boys and adolescent-onset CD girls, as proposed by Moffitt and Caspi (2001) since childhood-onset girls are less common than childhood-onset boys. Additionally, childhood-onset girls had the highest affective, behavioural and total scores compared to childhood-onset boys, albeit, these differences were slight and not statistically significant.

4.4. The Relation of Attachment and Psychopathy

As per Rutter et al.'s (2009) suggestion when studying attachment, instead of looking at closeness or security versus insecurity, specific disruptions in attachment relationships were analyzed (i.e., attachment avoidance and attachment anxiety). Additionally, past researchers addressing the association between attachment and psychopathy have also emphasized the need to look at attachment dimensions, and not merely closeness in adolescent-caregiver relationships (see Flight & Forth, 2007).

It was proposed that attachment avoidance and psychopathic characteristics were associated since past theorists have proposed that those high on psychopathy show a deficit in emotional reactivity, and thus, do not experience gratification from developing and maintaining strong bonds (Cleckley, 1941; McCord & McCord, 1964). Additionally, those high on psychopathy lack the need or desire to bond with others but rather, are more likely to disregard others or take advantage of "weaker" individuals (Saltaris, 2002). Insecure attachment, particularly a style of cold, distant and aloof relations (indicative of attachment avoidance) has been found to be detrimental to the development of empathy and pro-social socialization (Fowles & Kochanska, 2000;

Pardini et al., 2007). In the absence of empathy, callous features are more likely to develop, although no causal relationship has been established. Not surprisingly, there was a relationship found in the current study between attachment avoidance and affective features, although, not with the interpersonal and behavioural facets of psychopathy. Since indicators of attachment, such as coercive parent-child interactions, neglect, inconsistent parenting, and severity of punishment have been identified as determinants of antisocial outcomes (Greenberg et al., 1993; Loeber & Stouthamer-Loeber, 1986; McCord, 1979; McCord & McCord, 1964; Patterson, 1986; Sampson & Laub, 1990), it was not clear why an association between attachment avoidance and the behavioural facet of psychopathy was not found. One possibility is that a significant relationship between attachment avoidance and the behavioural facet is more likely explained by the inclusion of certain environmental factors such as parent criminality, neighbourhood safety, family support network, family alcohol, and drug use. In effect, without these factors, attachment avoidance alone does not significantly explain psychopathic behavioural traits. Additionally, since psychopathy factors were analyzed individually as well as collectively, specific attachment dimensions might not be as predictive for certain factors, such as the behavioural facet. For example, general attachment insecurity alone may predict the behavioural features of psychopathy and thus, should be assessed in future research. The absence of the expected relationship between attachment dimensions and the interpersonal facet of psychopathy, is possibly explained by the normative presence of its key traits in adolescence (i.e., grandiose sense of self worth, pathological lying, manipulation for personal gain, and impression management; Seagrave & Grisso, 2002). In addition, while it is difficult to explain why an inverse relationship between attachment avoidance and the interpersonal dimension was found in this study, it could infer issues with the interpersonal facet being apart of the construct within the adolescent population.

The expected inverse relationship between attachment anxiety and psychopathy was not significant, therefore one of the hypotheses in this study was not supported. Therefore, even though those with high psychopathic traits should theoretically show little anxiety within relationships, for adolescents opposed to adults, this relationship may be more complex and other factors such as biological functioning, parenting and other family dynamics should be considered in future research. This possibly suggests that,

particularly for adolescents, anxiety embedded in attachment is far more complexly related to psychopathy than theoretically anticipated. Additionally, the lack of significance found may be an artifact of a small sample.

Past research has shown that higher psychopathic traits are associated with less closeness with caregivers (Kosson et al., 2002) though there are some differences depending on specific relationships (e.g., Flight & Forth, 2007) such as only for fathers (not mothers and peers). Catchpole (2008) further found that those with attachment insecurity had higher psychopathy scores, in particular, affective features. Although, when attachment dimensions were assessed, boys and girls varied in their associations between dimensions and facets, which was not evident for this study when the subsample (main sample of interest) was analyzed. When the overall sample (n = 110) was analyzed, gender trends revealed that girls had stronger associations between attachment anxiety and affective features compared to boys. Additionally, boys had stronger associations with attachment avoidance and affective features than girls. This would be expected, given that the current study extended Catchpole's research using the same sample set data. Although, interestingly, when the subsample was analyzed in this study (n = 80), the relationships between attachment anxiety and affective features for girls disappeared. This indicates that with higher-risk adolescents, attachment avoidance becomes a greater risk factor in the association between affective features, especially for girls with childhood-onset CD. Results in the current study confirmed Catchpole's finding that attachment insecurity and affective features were related, but instead of explaining attachment generally (i.e., attachment insecurity), we found a relationship between affective features and attachment avoidance. This finding is significant for future research since CU traits have been found to predict more stable and higher rates of both delinquent behaviours (Frick et al., 2003; Lynam, 1997) and instrumental aggression (Frick et al., 2003). The findings from the current study emphasize the importance of understanding the risk factors that influence CU traits in order to assist in treatment programs to help decrease negative life outcomes.

4.5. Role of Attachment Dimensions, Childhood-onset Conduct Disorder, and Psychopathy

It was hypothesized that childhood-onset CD would likely play a moderating role in the relationship between attachment avoidance and psychopathy. This hypothesis was based on the research that indicates when aggressive behaviours develop at an early age, they impact attachment with parents and additionally, became a risk factor for later developing psychopathic characteristics. Preliminary analyses showed that youth with childhood-onset CD had significantly higher psychopathy scores than youth with adolescent-onset CD (i.e., higher behavioural and PCL: YV total scores). Howe et al. (2010) also found that high CU traits were more prevalent among childhood-onset CD children compared to adolescent-onset CD children, although this was not supported in the preliminary analyses for the current research. In the current study, further analyses demonstrated distinct differences between attachment, CD-onset, and psychopathy facets.

The regression analyses revealed that childhood-onset CD alone was not significant except for the overall model of psychopathy (i.e., PCL: YV total scores), but there was a significant moderation between attachment avoidance and childhood-onset CD on the affective facet of psychopathy. Very importantly, youth who had an avoidant attachment style to their mothers and who were also diagnosed with childhood-onset CD were more likely to have higher affective traits. In contrast, this interaction was not found between attachment avoidance and childhood-onset CD in relation to interpersonal and behavioural features of psychopathy. To the contrary and inexplicably, attachment avoidance with mothers was negatively associated with the interpersonal facet of psychopathy. Therefore, a grandiose sense of self-worth and manipulative style were *less* likely to be associated with avoidant attachment styles with their mothers. These unexpected results suggested that often stated concern that too many key psychopathy traits are normative adolescent developmental traits, and, therefore, independent of environmental risk factors for psychopathy (e.g., attachment to parents). Seagrave and Grisso (2002) argued that this fundamental developmental issue required that the PCL: YV should be used with caution regarding adolescents.

Therefore, it appeared that the psychopathy factors rather than the total scores were most important in understanding the relationship between attachment dimensions and psychopathy in this sample of adolescents. The results indicated that there were several significant relationships with some having moderate strengths, which justifies further research.

Even though attachment is not synonymous with parenting practices, these two terms are interrelated and help to understand the complexity of attachment and psychopathic characteristics. Specifically, the above findings on attachment and psychopathy help explain why dysfunctional parenting practices have been related to the stability of CU traits and antisocial behaviours in children and adolescents (Frick & Loney, 1999; Frick et al., 2003; Pardini et al., 2007). Frick et al. (2003) found children who were exposed to negative parenting practices exhibited an increase in CU traits from childhood to adolescence. Further, Pardini et al. (2007) demonstrated that warm and involved relationships with parents helped decrease children's callous features, as opposed to harsh, uncaring relationships with parents (Pardini et al. 2007). In effect, Pardini et al. (2007) indicated that secure attachments were fostered by warm and caring relationships. Results from this study supported this perspective (i.e., distant, cold and aloof relations with parents negatively effect empathy and increase the likelihood of the development of callous traits).

Further, research on the development of empathy in the context of child-parent relationships helped explain the relationship between attachment avoidance and deficient affective experience in childhood-onset CD youth. Kockanska (1995) asserted that without empathy and other related emotions, relationships are less likely to be positive and aid in overall healthy development. Furthermore, negative attachment styles lead to poor psychological well-being and adjustment throughout one's lifespan (Laible et al., 1999; Rosenstein & Horowitz, 1996). One important risk factor to antisocial outcomes is an absence of positive and affectionate parent-child bond (McCord & McCord, 1964). While specific attachment styles in relation to psychopathy have not been extensively studied, relationships that lack interpersonal connection and intimacy, more generally, have been identified as detrimental to the development of empathy and therefore, the increased likelihood of the development of callous-unemotional dispositions. While CU traits have been linked to genetic polymorphisms (Loney et al.,

2003; Viding et al., 2005; Viding, Jones, Frick, Moffitt, & Plomin, 2008), there is also evidence that CU traits were influenced by environmental factors. Specifically, a lack of attachment (or warm parental relationships) exacerbated these inherited tendencies (Pardini et al., 2007).

Furthermore, the role of childhood-onset CD appeared important concerning the relationship between attachment avoidance and affective features because childhood-onset behavioural problems were related to an increased association between distant, cold relationships with their mothers and deficient affective experiences. Kockanska (1993, 1997) asserted that having low behavioural inhibition increased the likelihood that children were exposed to early precursors that taught the importance of empathetic concern, and thus, these children were less likely to become emotional aroused by the misfortune and distress of others. In effect, childhood-onset CD youth are at an increased risk for developing callous features, based on developmental differences and the vulnerabilities that increase as a result of early behavioural problems. Overall, the findings from this research support the theoretical perspective that in the absence of close relationships with caregivers, the development of CU traits are more likely, especially for youth most vulnerable to adverse outcomes (i.e., childhood-onset CD youth).

4.6. Gender Differences in Childhood-onset Conduct Disorder and Psychopathy

Resulting from the small sample size, the exploratory section findings of this study's research have questionable generalizability. According to the gender paradox, girls should experience more adverse outcomes than boys who have conduct disorder, since it is a gender atypical disorder for girls. Even though this finding was not supported for total psychopathy scores, girls with childhood-onset CD showed the strongest association between attachment avoidance and affective features, albeit, not significantly different from boys. Specifically, attachment avoidance and the affective facet for both boys and girls were significant, however, for boys, those with childhood-onset and no CD had a significant relationship between attachment avoidance and affective features, whereas those with adolescent-onset CD did not. This non-significant

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but weakly positive relationship might have resulted from a small sample size in the adolescent-onset CD group (n = 9), which limits generalizability. These findings emphasized the role of attachment in the development of moral and empathetic internalization in boys, regardless of onset of behaviour problems. In contrast, for girls, those with childhood-onset CD had a strong relationship between attachment avoidance and affective features, whereas those with adolescent-onset and no CD did not.

Furthermore, in this sample, boys did not follow the strong theoretical research by Moffitt and Caspi's (2001) on developmental taxonomies. This may have be a result of boys not being high risk enough to show a distinct difference between childhood-onset and adolescent-onset. For example, if the entire sample came from a forensic setting, the differences between boys may be present due to the childhood-onset group being more extreme. Overall, results provided some support that childhood-onset CD placed girls at a heighted risk, compared to boys since conduct disorder was not needed for a strong association between attachment avoidance and affective features to have been present for boys. As stated above, the strong inverse association evident between attachment avoidance and interpersonal features (especially with girls) were not easily interpretable, although it calls into question the importance and validity of factors during adolescence when viewing psychopathy as a unitary construct for girls (see Odgers et al., 2005).

Finally, this study provided support for the importance of callous features in relation to distant attachment styles. Callous features differentiate minor offenders from serious violent offenders (Frick et al., 2003; Pardini, 2006) and, as well, this study raised the issue of environmental factors such as attachment styles. For example, positive attachment with caregivers has been associated with the decrease in callous traits in children (Pardini et al., 2007), and subsequently a reduced likelihood of engaging in future violent offenses (Skeem et al., 2003). This study added support to the theoretical consensus that the affective factor, specifically the CU traits, are central to the conceptualization of psychopathy for adolescents and are influenced by environmental and behavioural factors.

4.7. Limitations and Future Directions

The current study had several limitations. Some limits involved construct measurements. As previously stated, there were several validity concerns regarding the applicability of the PCL: YV in female samples (Odgers et al., 2005; Schrum & Salekin, 2006; Sevecke et al., 2009). Most importantly for this study, Sevecke et al. (2009) reported that the two-three- or four-factor models did not provide acceptable fit among high-risk adolescent females. This raised concerns about the current study findings, however, Schrum and Salekin (2006) found the personality dimensions of psychopathy were more relevant than the behavioural traits. Within this study, the only significant finding from the main analyses included the affective facet that has been found to apply to girls (Schrum & Salekin, 2006). Another potential limitation of this study was the exclusion of Factor 4, the lifestyle facet. It was excluded for this study based on theoretical basis discussed above, nonetheless, it could be argued its exclusion is a limitation because psychopathy is a unitary construct that requires a lifestyle facet associated with criminal violent behaviours. The rationale, though, was that antisocial characteristics within the lifestyle facet were viewed as an outcome of psychopathy, rather than as part of the construct (Cooke & Michie, 2001; Farrington, 2005; Skeem & Cooke, 2010). An alternative model of psychopathy that has shown promising results is the Comprehensive Assessment of Psychopathic Personality (CAPP; Cooke, Hart, Logan, & Michie, 2004). The CAPP is a broad, personality-based model of psychopathy that uses a lexical model is measure psychopathy. Additionally, it is the only current measurement that is gender-sensitive (Kreis & Cookie, 2011). Future research should consider using the CAPP instead of the PCL: YV due to the extensive validity issues with the PCL: YV, especially in regards to females.

In addition to the drawbacks of the PCL: YV, the use of self-report measurements (i.e., the use of the CAPAI) has inherent limitations including truthfulness and recall reliability or memory. Schwarz (1999) stated, "self-reports are a fallible source of data, and minor changes in question scoring, question format, or question context can results in major changes in the obtained results" (p. 93). Additionally, self-report measurements increase the potential for response bias (Moskowitz, 1986). Another issue was with retrospective reporting on the DICA-R for age of onset. Retrospective reporting has been

associated with error and the quality of long-term retrospective reporting is cautioned against (Beckett, Vanzo, Sastry, Panis, & Peterson, 2001). To address these issues, a semi-structured interview design for attachment scores in adolescent relationships would offer more support for the current findings and for the validity of the CAPAI as a strong attachment measurement. And lastly, using official files for conduct disorder diagnosis would add to the methodology of this study. There is also be a need to look at gender specific models if the sample size allows, in order to gain a better understanding of what factors influence boys and girls and if there are gender specific factors.

Another limitation was that the present sample did not included community-based youth, only those within a forensic or mental health setting. Future research should address this limitation by replicating this study with community based samples, and also, with other high-risk populations. In addition, also maintaining an equal ratio of boys to girls is important (as this study did) in order to further understand the complexities of gender differences when looking at male focused personality and behavioural disorders. Additionally, having a larger sample size would be necessary for future research in order to obtain the power needed to detect more significant moderation effects and to conduct separate regression analyses for boys and girls. As past research has shown, a sample size above 120 is usually necessary to detect medium to large effect sizes (Stone-Romero & Anderson, 1994). Therefore, future research should do missing data analysis regardless of missing type. For this study in particular, even if data was imputed, the unequal group sizes would have caused major issues (Aguinis, 1995) rather than the small sample size for the moderation models since there would have been 76 participants with a childhood-onset diagnosis and 31 with adolescent-onset as opposed to 50 and 30, respectively. Thus, future research should obtain as equal groups as possible with respect to location, gender and CD-onset, allowing for more complex analyses.

In order to fully understand the relationship between attachment and psychopathy, causality should be addressed, which is something that could not be studied within the current research. In order to do so, more advanced methodology (i.e., structural equation modeling (SEM)) would be an area to explore for future research. An SEM model looking at longitudinal assessment on how caregivers shape adolescents development and possibly, the presence of psychopathic characteristics, particularly

callous traits, would be beneficial. It has been theorized that callous features are inherited and therefore, will present themselves regardless of parenting and attachment styles. Although it has also been theorized that attachment towards parents plays a pivotal role in establishing healthy relationships and by extension, the development of empathy and therefore, protects against callous traits and additional psychopathic characteristics. Overall, since this area of research is understudied, assessing these relationships longitudinally is necessary while also controlling for other external variables, such as other psychological and/or behavioural disorders to get a clearer picture of the relationship between predictor variables of interest and psychopathy..

Additionally, since there was a lack of association between attachment avoidance and behavioural features of psychopathy, devising a model with additional related factors would help understand why this was the case. This would allow for a more in-depth and comprehensive picture of what is causing psychopathic characteristics in adolescents. For example, Farrington, Ullrich and Salekin's (2010) review found that for the behavioural traits of psychopathy, the most important factors to consider are parental conflict, a depressed mother, a young mother, a large family, and poor parental supervision. Furthermore, addressing the mediating effect of some important variables, such as maltreatment and trauma, especially for girls (Odgers et al., 2005) should be explored further using SEM modeling. This study was simplistic in its approach, thus future research needs to add to the current study's model to fully understand these complex relationships.

Lastly, future research should also study father-adolescent relationships, since some past research has shown conflicting research on the importance and significance of mothers versus fathers (Flight & Forth, 2007). The current study did not do this since the purpose was to emphasize the effect of primary attachment relationships, which have theoretically been validated as mother-child relationships (Bowlby, 1973). While this study offered small to moderate significant findings, these results offered more support that connection matters within mother-adolescent relationships and severed connections can lead to negative outcomes, most likely in the development of callous features, the core dimension of PPD.

5.   Conclusions

Despite these limitations, the current study expands the knowledge on the role of attachment in relation to psychopathic characteristics, particularly the core of psychopathy – deficient affective experiences. While not all of the main hypotheses were supported, this study still offers important insights into the construct of psychopathy and the differential role of certain factors. This study is also one of the few studies that addressed attachment in terms of attachment dimensions and not closeness to caregivers, in addition to utilizing a high-risk sample, not a community based sample. While this study only focused on maternal relationships, it helps expand the knowledge base on what important environmental factors are influencing psychopathy, and the strengthening role of early behavioural disturbances on the association between distant attachment styles and affective features. The findings address the need to further analyze gender based differences and the specific role that attachment plays in relation to psychopathy factors and psychopathy as a unitary construct.

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Appendices

Appendix A.

Histograms

Figure 1. Distribution of PCL: YV Total Scores
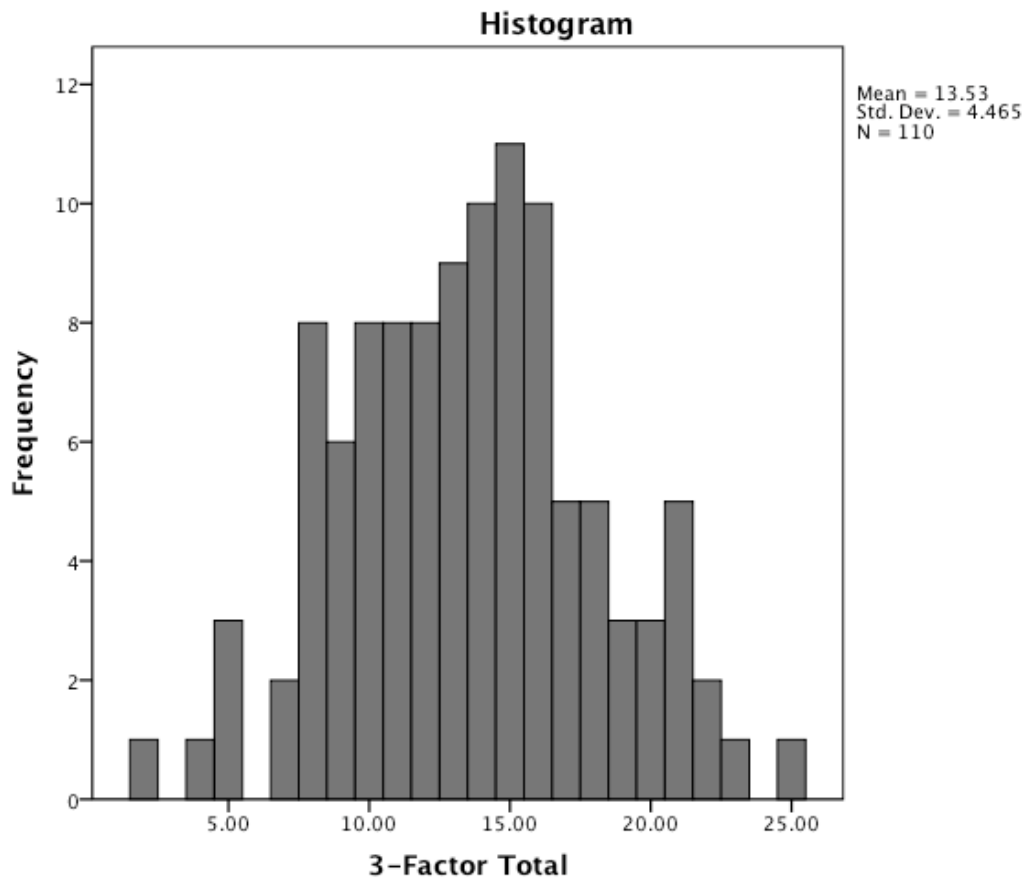
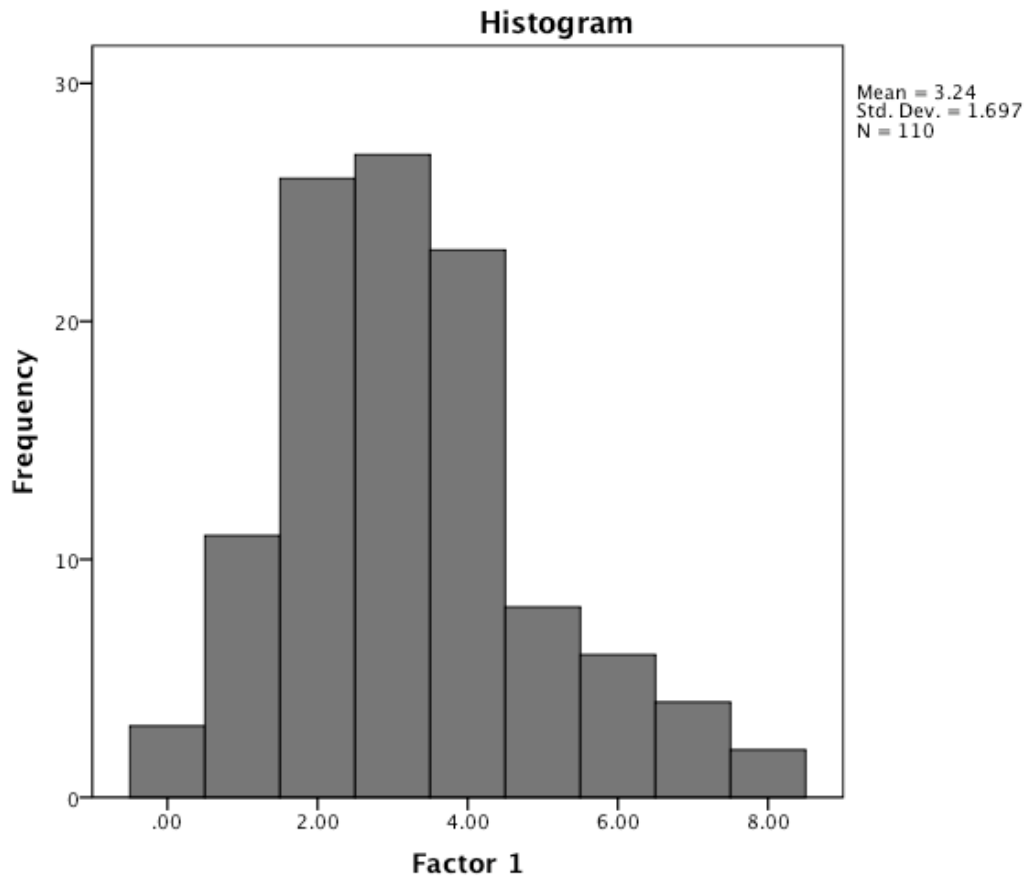**Figure 2.   Distribution of PCL: YV Factor 1 Scores**

Histogram

Mean = 3.24
Std. Dev. = 1.697
N = 110

Figure 3.   **Distribution of PCL: YV Factor 2 Scores**

Histogram

Mean = 4.18
Std. Dev. = 1.833
N = 110
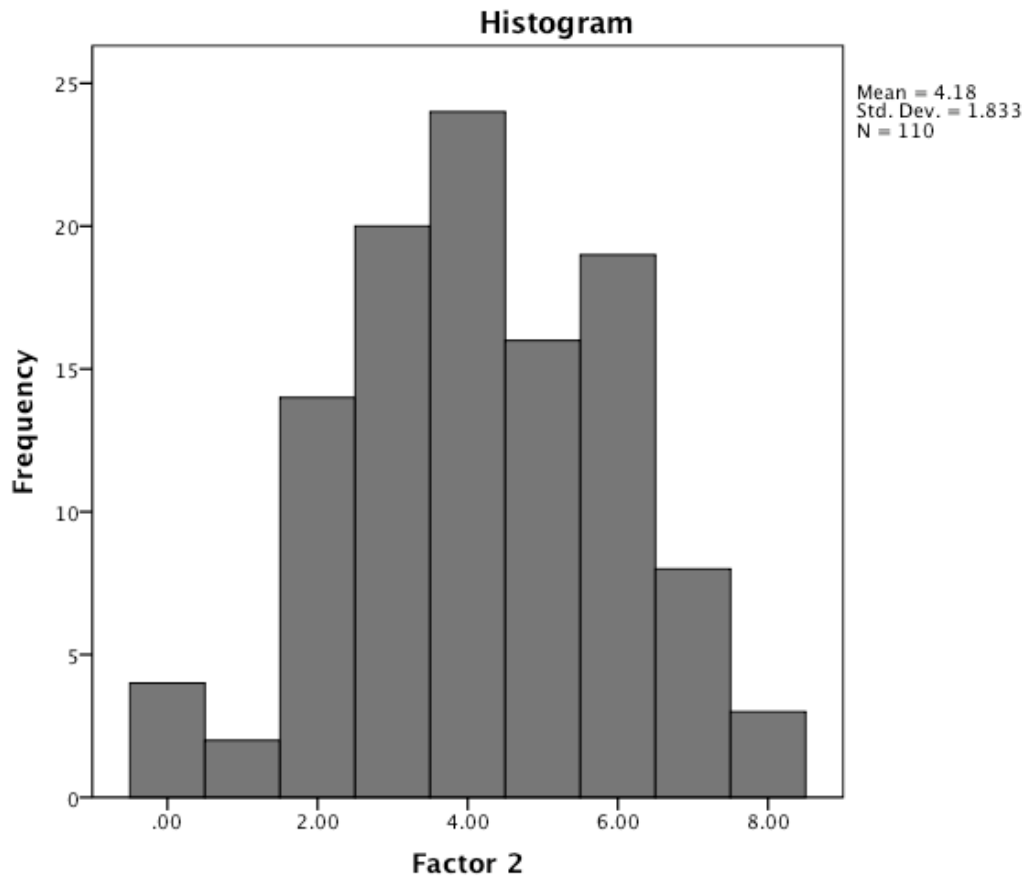
Figure 4.   Distribution of PCL: YV Factor 3 Scores

Histogram

Mean = 6.11
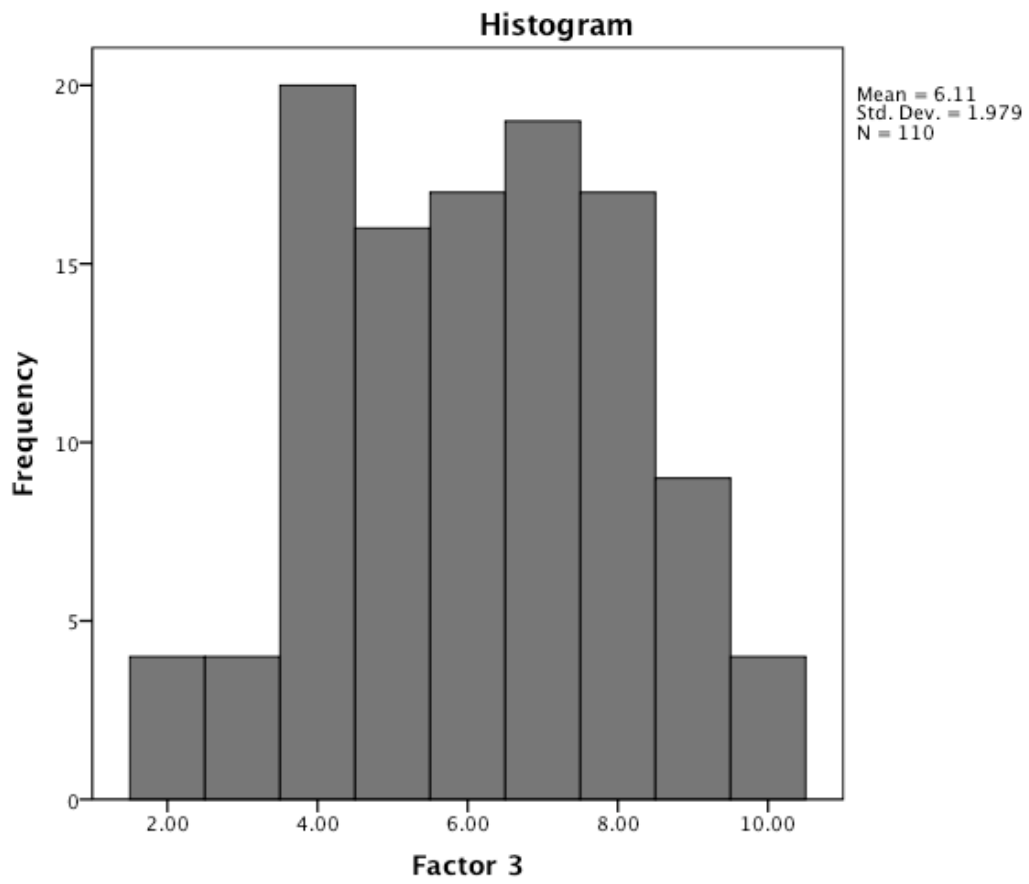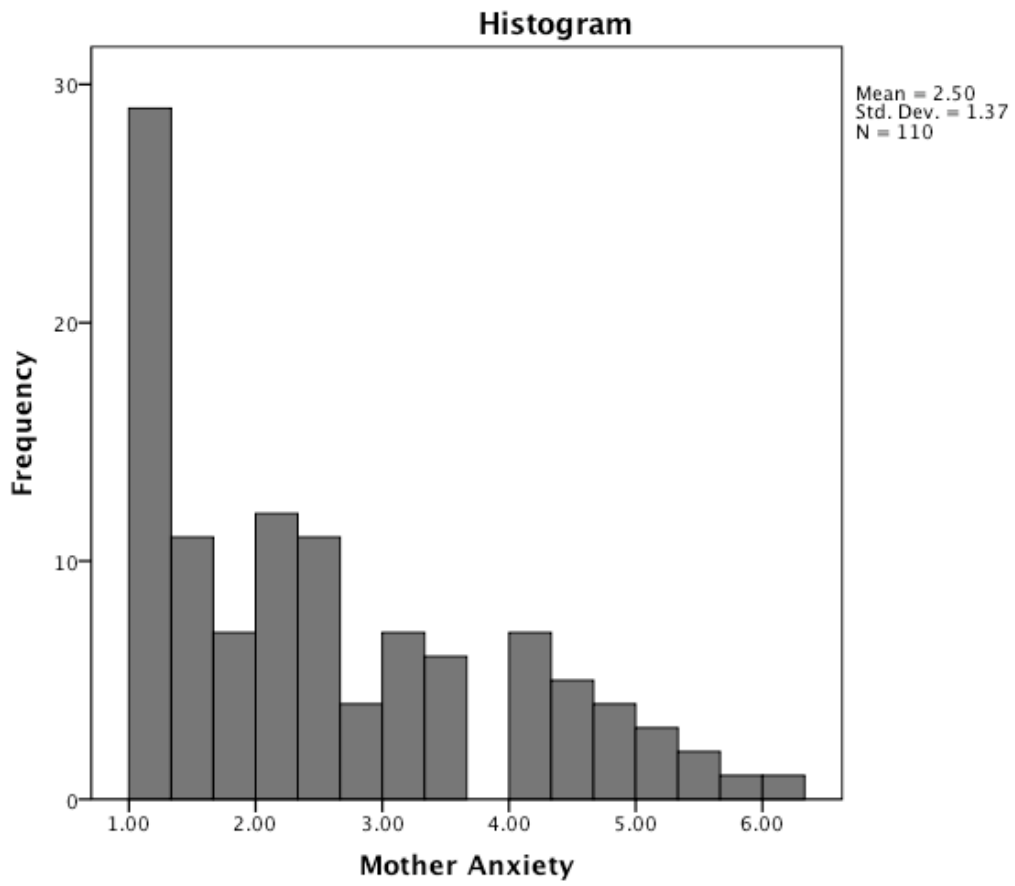Std. Dev. = 1.979
N = 110

Figure 5.   Distribution of Attachment Anxiety

Figure 6.   Distribution of Attachment Avoidance

Histogram

Mean = 3.25
Std. Dev. = 1.762
N = 110