

**PARENT-CHILD ATTACHMENT AND  
DEFENSE MECHANISMS:  
A DEVELOPMENTAL PERSPECTIVE ON  
RISK-TAKING BEHAVIOUR IN A  
CLINICAL SAMPLE OF ADOLESCENTS**

by

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## ABSTRACT

Attachment theory provides a model of childhood social and emotional development within the family environment. Parental responses to their children's affective signals provide the critical context within which children organize and regulate their emotional experiences. The current research extends the attachment literature by examining the notion of *ego defense mechanisms*, defined as unconscious mental processes that are used to protect the self from painful emotions, ideas and drives and may be used to regulate emotions experienced in relationships. The current study examined attachment and defense mechanisms in relation to risk-taking behaviour among adolescents. Participants were 106 adolescents (58 males; 48 females) recruited from the Maples Adolescent Centre, a multidisciplinary assessment facility in Burnaby, B.C. Youth completed the Family Attachment Interview - Modified, the Thematic Apperception Test (TAT), and the Diagnostic Interview for Children and Adolescents - Revised. Results revealed significant relations between insecure attachment and risk-taking behaviour including aggression, substance abuse symptoms, and suicide attempts. The current study also highlighted the role of defense mechanisms. Of particular interest was evidence for projection in the prediction of aggression and denial as a potential protective factor with respect to suicide attempts. Results are discussed in terms of their relevance to current models of aggression. Implications for clinical interventions and future directions in research are also addressed.

**Keywords:** parent-child attachment; defense mechanisms; behavioural functioning; adolescent development.

## DEDICATION

This project is dedicated to the youth participants who openly shared their life stories.

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## INTRODUCTION

### **Attachment theory: A developmental model of emotional and behavioural self-regulation**

Attachment theory (Bowlby, 1969, 1973, 1980) proposes that the quality of parent-child interactions shapes the development of *internal working models* of attachment figures and of the self that organize cognitions, affects, and behaviour (Mikulincer, 1995). The current study adopts an attachment theory perspective in examining the role of specific internal affect regulation strategies, or *defense mechanisms*, in relation to the behavioural functioning of clinically-referred adolescents. Although it is well established that attachment influences behaviour in youth (e.g., Allen, et al., 2002; Cooper, Shaver & Collins, 1998; Wagner, Silverman, & Martin, 2003), and that specific defense mechanisms are linked to behavioural functioning (e.g., Cramer, 2006; Porcerelli, Cogan, & Kamoo, 2004), research has yet to examine how these two processes operate in conjunction. The current study had three primary objectives:

1. To re-examine the relations between insecure attachment and risk-taking behaviour in adolescents using the two-dimensional model of attachment (Bartholomew, 1990);
2. To examine the relations between anxious and avoidant attachment and defense mechanisms; and
3. To examine the role of defense mechanisms as mediators of the relation between attachment and risk-taking behaviour in adolescents.

**Background**

Bowlby's (1973; 1980) contributions to understanding child development and psychopathology are immense. He first introduced the concept of internal working models of self and other and their role in personality development and psychological functioning. Internal working models are defined as mental representations that emerge during childhood based primarily upon experiences with significant caregivers. These models are theorized to maintain themselves by biasing perception and cognition and influencing the child's active choice of interpersonal environments (Simons, Paternite, & Shore, 2001).

Attachment theory asserts that experiences of caregiver attunement and responsiveness promote the development of a representational model of the caregiver as accessible and responsive and of the self as worthy of eliciting care. Such children are classified as securely attached to their caregivers (Ainsworth, Blehar, Waters, & Wall, 1978). Children in high-risk environments, however, often experience their caregivers as unresponsive to their signals of distress or unable to respond appropriately. Maltreated children, for example, form images of themselves as unworthy and ineffective in obtaining their caregiver's attention and benevolence (Bretherton, 1985; Crittenden & Ainsworth, 1989).

The notion of attachment theory as a theory of emotion regulation was introduced in a classic paper by Sroufe and Waters (1977). They described attachment as an *organizational construct* in that parental responses to their children's affective signals provide the critical context within which children organize emotional experiences and regulate their *felt security* (Goldberg, 2000). During early development, children depend

on their caregivers who, through sensitive responding balanced with encouragement of autonomy, perform self-regulatory functions for them and provide *containment* of emotional states (Hobbs, 1997). Ainsworth's work also emphasized the notion of maternal sensitivity, or appropriate responsiveness, as helping children achieve confidence in their ability to control what happens to them (Bell & Ainsworth, 1972).

The functions performed by attachment figures change throughout development. Adolescence represents a developmental transition from primarily parental-directed, external regulation of emotional states and behaviour to more autonomous, internal regulation. Adolescence has been conceptualized as the bridge between childhood and adulthood, between dependency and autonomy (Moretti & Holland, 2003). Finding a balance between dependency and autonomy fosters the youth's ability to be both self-reliant and emotionally connected to others (Harwood, Miller & Irizarry, 1995). When such a balance is not achieved, emotional and behavioural problems may escalate, including problems such as aggression, substance abuse, and suicidal and self-mutilating behaviours. The current study examined these emotional and behavioural problems and their relations to attachment and defense mechanisms within a clinically-referred sample of adolescents.

### **Two-dimensional model of attachment**

Bartholomew (1990) proposed a two-dimensional model of attachment based on Bowlby's original conceptualization of internal working models. Bartholomew's model defines four prototypic attachment patterns in terms of the intersection of two higher-order dimensions corresponding to representations about self and others. The *view of self* or anxiety dimension reflects one's sense of self-worth and degree of anxiety experienced

in relationships (Griffin & Bartholomew, 1994a). This dimension reflects a tendency toward *hyperactivation* of the attachment system (e.g., desire for proximity to attachment figures, hypersensitivity to signs of possible rejection or abandonment, ruminating on personal deficiencies; Shaver & Mikulincer, 2005). The *view of other* or avoidance dimension reflects how positively one views others and relates to the degree of avoidance demonstrated in relationships (Griffin & Bartholomew, 1994a). This dimension is typically characterized by strategies for *deactivating* the attachment system (e.g., inhibition of proximity-seeking, suppression of attachment-related distress, discounting threats that might activate the attachment system; Shaver & Mikulincer, 2005). There is converging evidence supporting this two-factor structure underlying measures of adult attachment styles (e.g., Brennan & Shaver, 1995; Griffin & Bartholomew, 1994a; Kobak, Cole, Ferenz-Gillies, Fleming, & Gamble, 1993; Scharfe, 2002).

Each of the four prototypic attachment patterns is characterized by a distinct pattern of emotional regulation and interpersonal behaviour (Goldberg, 2000; Griffin & Bartholomew, 1994a). Figure 1 displays the four attachment patterns in which each cell represents a prototype that individuals approximate to different degrees. The secure attachment pattern is based on a positive view of the self as worthy of love and support, and a positive view of others as trustworthy and available. This results in a sense of comfort with intimacy while maintaining personal autonomy, as reflected in low levels of anxiety and appropriate interpersonal approach behaviours in times of perceived threat. The fearful attachment pattern is characterized by a negative view of the self and a negative view of others. This results in high levels of anxiety, fears of rejection, and interpersonal avoidance to prevent further loss or rejection. Preoccupied attachment is

characterized by a negative view of the self as unworthy of love and support and a positive view of others. This results in chronic fears of abandonment and the active pursuit of closeness and reassurance from others. When their intimacy needs are not met, individuals characterized by preoccupied attachment are vulnerable to extreme distress. Finally, the dismissing attachment pattern is characterized by a positive view of the self and a negative view of others. This pattern is associated with compulsive self-reliance, low anxiety, and limited intimacy in relationships (Bartholomew & Horowitz, 1991; Griffin & Bartholomew, 1994a). The advantage of this two-dimensional model is that individuals are considered to approximate each of these four attachment prototypes to varying degrees, thus providing a multidimensional assessment of attachment. The current study utilized this methodology in the examination of parent-child attachment in adolescents.

### **Attachment theory and behavioural functioning**

Bowlby conceptualized anger as a functional response to separation or rejection. From his perspective, anger is an attempt to prevent permanent loss, either by overcoming the obstacles to reunion or, by discouraging the loved one from going away again (Bowlby, 1973). According to Bowlby, “the most violently angry and dysfunctional responses ... are elicited in children and adolescents who, not only experience repeated separations but, [sic] are constantly subjected to the threat of being abandoned” (Bowlby, 1973, p. 249). However, Bowlby also suggested that, “while on the one hand a child is made furiously angry by a parent’s threat to desert, on the other he dare not express that anger in case it makes the parent actually do so” (1973, p. 250). He proposed that violent behaviours might be a result of anger at a rejecting parent becoming “repressed and then

directed at other targets” (Bowlby, 1973, p. 250) such as oneself, peers, strangers, or objects.

There is a growing body of literature examining associations between insecure attachment and behavioural problems across the age span. Of particular relevance to the current investigation of adolescent risk-taking behaviour are a number of studies supporting a link between insecure parent-child attachment and aggressive, violent, delinquent, and suicidal behaviour in adolescents (e.g., Crawford, et. al., 2006; Franke, 2000; Leas & Mellor, 2000; Simons, Paternite, & Shore, 2001; Wagner, Silverman, & Martin, 2003; West, Spreng, Rose, & Adam, 1999). The following provides a brief overview of relevant research examining specific patterns of insecure attachment in relation to risk-taking behaviour.

Research findings examining the relations between attachment, aggression, and substance use in adolescents have produced equivocal findings: both anxious and avoidant attachment patterns play a role. Some researchers have found that avoidant attachment in children and adolescents is related to higher levels of aggression, violence (e.g., Finzi, et. al., 2001; Danov & Bucci, 2002), and conduct and substance abuse disorders (Rosenstein & Horowitz, 1996). Other research has shown that anxiously attached youth reported the highest levels of risk behaviours including property crimes, delinquent behaviour, substance abuse, and risky sexual behaviours (e.g., Allen, et. al., 2002; Allen, Moore, Kuperminc, & Bell, 1998; Cooper, Shaver, & Collins, 1998).

Although each of these studies make a unique contribution to the literature, considerable differences in the samples examined may account for some of the apparent discrepancy across their findings. For example, Rosenstein and Horowitz (1996) found



that in a psychiatrically hospitalized sample of adolescents, youth showing a dismissing attachment organization were more likely to have a conduct or substance abuse disorder. Similarly, Finzi and colleagues (2001) found that physically abused children more often demonstrated an avoidant attachment organization and manifested significantly higher levels of aggression, compared to neglected and non-abused/non-neglected children. Allen and colleagues (2002), on the other hand, identified preoccupied attachment as a significant predictor of increasing levels of delinquency from mid to late adolescence in a sample of youth, at moderate risk for academic difficulties, recruited through the public school system.

The literature examining the relations between insecure attachment and suicidal and other self-harming behaviour is less extensive. Much of this research has examined insecure attachment qualities rather than specific patterns of insecure attachment (e.g., Gratz, Conrad, & Roemer, 2002; Violato & Arato, 2004; Wagner, Silverman, & Martin, 2003; West, Spreng, Rose, & Adam, 1999). There is some support, however, for specific associations between anxious attachment and suicidal ideation and behaviour (e.g., Lessard & Moretti, 1998; Mullaley, 2004). In addition, Adam, Sheldon-Keller, and West (1996) found that preoccupied attachment, in interaction with *unresolved-disorganized* attachment, was associated with history of suicidal behaviour and severe suicidal ideation in a psychiatric sample of adolescents. Unresolved-disorganized attachment is characterized by an inability to maintain coherent discourse (e.g., lapses in continuity of thinking; illogical or unusual beliefs) when discussing traumatic relationship experiences such as loss or abuse.

The first objective of the current study was to re-examine the relations between insecure attachment and risk-taking behaviour using the two-dimensional model of attachment (Bartholomew, 1990) in a clinically referred sample of adolescents. This model offers a useful framework for understanding the potential interactions among anxious and avoidant attachment patterns in the prediction of these behaviours. Informed by attachment theory and the existing research literature, I made the following predictions:

1. Anxious and avoidant attachment will be associated with aggressive behaviour. This is in keeping with Bowlby's (1973) conceptualization of anger and violent behaviour as an expected response to repeated separations or threats of abandonment by attachment figures. This prediction does not preclude, however, the possibility of aggression serving different psychological *functions* for anxious and avoidant attachment orientations.
2. Avoidant attachment will be associated with substance abuse symptoms. Individuals who demonstrate higher levels of attachment avoidance tend to rely on deactivating strategies for suppression of attachment-related distress (Shaver & Mikulincer, 2005). I postulated that this attachment orientation would be associated with more severe substance abuse due to its potential role in suppressing distress.
3. Anxious attachment will be associated with suicidal and self-harming behaviour. Given the characteristically negative self-view of highly anxiously attached individuals, I predicted that this attachment orientation would be related to self-directed harming behaviour.

**Defense mechanisms: Strategies for regulating affect in relationships**

The second focus of the current research is on understanding the relations between anxious and avoidant attachment and defense mechanisms. The notion of defense mechanisms for regulating affect in relationships is consistent with an attachment theory perspective. Bowlby's concept of *defensive exclusion* involves internal processes of selectively attending to, or distorting, new information and memory to prevent unacceptable information from entering awareness. These defensive processes interfere with updating, or *accommodating*, internal working models in response to external reality in situations where children's experiences of their parents are too painful to sustain in awareness (Bretherton, 1992). Although these processes protect children from painful experiences, they also interfere with intercommunication between behavioural subsystems. Consequently, if particular behavioural systems are not activated appropriately some of this defensively excluded information may be experienced in inappropriate contexts (Bretherton, 1985). For example, a child may redirect his/her denied anger toward his or her parent at another child or object. The specific defense mechanisms examined in the current research have their origins in psychoanalytic theory and show many similarities to current social-cognitive information processing constructs.

Freud first conceptualized defenses as *ego functions* carrying out the function of protecting the ego against instinctual demands (Freud 1926, as cited in Cramer, 1991). Ego functions include such processes as reality testing, judgment, attention, memory, perception, and regulation of impulses and affects. Ego defense mechanisms are now defined as unconscious mental processes that are used to protect the ego from painful

emotions, ideas, and drives by altering perception of either disturbing external events or internal states (A. Freud, 1946).

Defense mechanisms are adaptive to the extent that they promote continued ego functioning and development. In theory, such mechanisms become pathological through exaggeration or distortion (Cramer, 1991). Anna Freud (1965) emphasized the balance (i.e., use of several defenses), intensity, and age appropriateness of defenses in determining normality versus pathology. For the purposes of the current research, to the extent that defenses are rigid, or developmentally inappropriate, they are considered pathological and related to a range of social, emotional, and behaviour problems.

In order for defense mechanisms to serve their protective function, the individual must be unaware of their occurrence. Based on this conceptualization, recent researchers have emphasized the importance of using projective story telling techniques, rather than relying entirely on self-report instruments, for assessing these unconscious processes. In the current research, I utilized an empirically supported coding system for the Thematic Apperception Test (TAT). Cramer (1987; 1991) developed the Defense Mechanism Manual for coding the use of three specific defenses, denial, projection, and identification, during storytelling in response to TAT cards. These three types of defense mechanisms are the focus of the following discussion.

### **A developmental model of defense mechanisms**

The theories of Piaget (1952), Kohlberg (1969), Loevinger (1966), and Erikson (1964) offer substantial support for qualitatively different stages of ego function development in terms of cognition, judgment, reasoning, and self-other relationships (Cramer, 1991). In addition, research by Cramer and colleagues (Cramer, 1987, 1997;

Cramer & Gaul, 1988) with children and adolescents has provided significant support for the theoretical claim that defenses, as another ego function, follow a developmental progression.

Denial, being the least mature defense, has been observed as early as three months and throughout the first three years of life (e.g., Fraiberg, 1982; Ainsworth, Blehar, Waters, & Wall, 1978). It also tends to be the most frequently used defense throughout the primary school years (Cramer, 1991; 1997). Denial functions to protect young children by *warding off* upsetting perceptions of the world. This process occurs through a number of mental operations including withdrawing attention from reality, distorting what is perceived so that it becomes less painful, or constructing personal fantasies that replace the disappointments of reality (Cramer, 1991). Each of these components of denial was coded in the current study using the Defense Mechanism Manual developed by Cramer (1987; 1991). Appendix A provides an overview of these coding categories.

In theory, denial functions to alleviate anxiety by changing external reality; in contrast, projection changes internal reality by placing threatening impulses outside the self (Cramer, 1991). Research findings show that projection begins to develop during the early years of childhood but does not become predominant until late childhood and early adolescence (Cramer, 1991; 1997). The psychological process of projection is theorized to protect the child from overwhelming anxiety by attributing unacceptable feelings, wishes, and impulses to someone else (Cramer, 1991). This process is developmentally more complex than denial and involves the capacity to differentiate between self and other and to make judgements of good versus bad. When projection is used as a defense,

some alteration or misperception of reality takes place (Cramer, 1991; see Appendix A for detailed definitions of coding categories).

Finally, identification, the third defense mechanism addressed in the current research, refers to modifying the self in order to increase one's resemblance to another person taken as a role model (Schafer, 1968). Anxiety caused by the loss or anticipated loss of a significant other is reduced by recreating the other internally, through a process referred to as *internalization of the lost object* (Menaker, 1979, p. 215, as cited in Cramer, 1991). Identification also refers to the process of acquiring parental and societal standards or rules of conduct as a means of regulating unacceptable impulses (see Appendix A for coding definitions). As with the other two defenses, the beginnings of identification may be seen in the first two years of life; however, research has shown it is used significantly more often during late childhood and adolescence (Cramer, 1991; 1997; Hibbard & Porcerelli, 1998).

### **Attachment theory and defense mechanisms**

The literature presented thus far suggests fairly robust associations between insecure attachment and a broad range of behavioural problems in adolescents. To date, the literature examining associations between insecure attachment and specific defense mechanisms is more limited. Recent dissertation research offers some support for associations between insecure attachment patterns and defensive styles in adults (e.g., Biernbaum, 1999; Filippides, 2004; Muderrisoglu, 1999; Strasser, 2002). More specifically, there is growing support for associations between dismissing attachment and higher use of distancing defenses (Muderrisoglu, 1999), as well as dismissing attachment and denial, acting out, and suppression (Strasser, 2002). The current study extends this

literature by examining the relations between anxious and avoidant attachment and three defenses: denial, projection, and identification.

**Predicted mediator models: Attachment, defense mechanisms and risk-taking behaviour**

The third objective of the current research was to examine the mediating role of defense mechanisms as potential processes through which insecure attachment and risk-taking behaviours are linked. By integrating attachment theory with theories of defense mechanisms, the current research examined the three mediation models presented in Figure 2.

First, I predicted that projection would mediate between both anxious and avoidant attachment and aggressive behaviour problems. I theorized that the components of projection, as assessed in this study (e.g., attribution of responsibility and hostile intent to others; attempts to protect oneself from perceived threats; see Appendix A for details), would account for the associations between anxious and avoidant attachment and verbally or physically aggressive behaviour (e.g., blaming others, bullying, initiating physical fights). Recent empirical findings have shown that projection in males is associated with a suspicious, hostile, oppositional behaviour pattern (Cramer, 2002a), psychopathic and narcissistic personality styles (Cramer, 1999), and poor interpersonal relationships (Cramer, Blatt, & Ford, 1988).

A number of theoretical perspectives also support this hypothesis. For example, psychoanalytic formulations of violent youth suggest that such behaviour represents an attempt to manage overwhelming anxiety and helplessness by *ridding* the self of unacceptable wishes to hurt one's own caregivers through various projective mechanisms

(Campbell, 1996). In addition, social cognition theories have explored *hostile attributional biases* in social information processing in relation to aggressive behaviour in children (e.g., Crick & Dodge, 1994; Dodge, 1980; Dodge & Coie, 1987; Quiggle, Garber, Panak, & Dodge, 1992). Consistent with the notion of projecting unacceptable affect, as a defense against the discomfort of experiencing this in oneself, hostile attribution bias has been found to be *self-referenced* – that is, this bias is restricted to attributions about another’s intentions toward oneself and does not influence attributions about another’s intentions toward a third party (Dodge & Frame, 1982). Preliminary support has also been found for the mediating role of hostile attribution biases between negative parenting or insecure attachment and aggressive behaviour in children and adolescents (e.g., Gomez, Gomez, DeMello, & Tallent, 2001; Simons, Paternite, & Shore, 2001; West, 2002).

Although there is a strong theoretical and empirical rationale for examining the mediating role of projection, similar models for denial and identification examined in the current research were more exploratory in nature. First, the potential mediating role of denial between avoidant attachment and engagement in substance use was examined. Based on attachment theory and available research, I predicted that avoidant attachment would be related to denial as a possible deactivating strategy for regulating attachment-related distress. In turn, I hypothesized that the theoretical components of denial (e.g., perceptual avoidance, minimization of negative consequences, self-enhancing idealized fantasies), may account for the association between avoidant attachment and substance abuse symptoms. Previous research offers some support for links between avoidant attachment and denial (Strasser, 2002), defensive deactivating strategies (e.g.,



suppressing thoughts or deploying attention away from attachment-related threats; Shaver & Mikulincer, 2005), and substance abuse (e.g., Rosenstein & Horowitz, 1996).

Finally, within the existing literature, identification has been associated with both positive (e.g., better interpersonal relationships; and social competence) and negative outcomes (e.g., histrionic personality features) in adults (Cramer, Blatt, & Ford, 1988; Cramer, 1999; 2002a). Cramer and Blatt (1990) suggest that high scores on identification among individuals experiencing significant psychological disturbance may be indicative of a pathological identification rather than an indication of psychological strength. The current study explored the potential mediating role of identification between anxious attachment and suicidal and self-harming behaviour within a clinical sample of adolescents. I speculated that identification, as assessed in the current study (e.g., attempts to emulate role models; concern for achieving others' expectations for the self), would be linked to the hyperactivating strategies (e.g., sensitivity to perceived rejection, ruminating on personal deficiencies) characteristic of anxious attachment (Shaver & Mikulincer, 2005). I further postulated that identification with a critical or rejecting attachment figure would likely result in self-critical evaluations and internalized punitive standards for the self, thus accounting for the association between anxious attachment and self-harming behaviour. This hypothesis is informed by psychoanalytically oriented theories suggesting that when individuals identify with and internalize the objects of their love with ambivalence (as is likely the case for anxiously attached individuals), they may direct their own aggressive impulses against the internalized love-object (i.e., themselves) whom they both love and hate (Shneidman, 1980).

## METHOD

### Participants

Participants were recruited from the Maples Adolescent Centre, Response Program, in Burnaby, B. C., Canada. Data collection procedures were completed during two separate time periods: September 1997 to February 1999; and March 2003 to December 2005<sup>1</sup>. Adolescents were voluntarily admitted to the response program for the purpose of a multi-disciplinary assessment and development of a comprehensive plan of care (see Holland, Moretti, Verlaan, & Peterson, 1993, for a more detailed description of the assessment program). The single criterion for referral into this program, for both male and female youth, is the presence of severe emotional or behavioural problems. Youth with previously documented intellectual deficiencies or acute thought disorder are excluded from this program.

Across the two time periods in which the study was completed, 216 youth of 418 consecutive admissions participated. Reasons for exclusion from data collection or analytic procedures are displayed in Table 1. It is noteworthy that only 16% of youth admitted to this program declined to participate in the study. Another 32% of youth were not approached to participate for various reasons (e.g., intellectual deficits, diagnostic issues, data matching procedures). Fifty-two percent of youth admitted to this program agreed to participate. Of the 216 youth who agreed to participate, another 110 subjects were excluded from data analysis due to incomplete data or technical and/or administration difficulties during data collection (see Table 1 for details). The final sample of 106 youth consisted of 58 males and 48 females who ranged in age from 11 to 17 years old ( $M = 14.52$ ;  $SD = 1.23$ ; Table 4).

Additional information regarding family and cultural background are presented in Tables 2 and 3. The majority of youth reported a Caucasian ethnic background (80%). The most common minority group identified was Aboriginal (10%). Most youth were living with at least one of their biological parents (62%) or in a foster/group home (28%) at the time of admission. Sex differences with respect to ethnicity and living arrangement are noted in Table 2. The majority of youth reported that their biological parents were their primary attachment figures (87% and 62% for maternal and paternal, respectively); however, stepfathers also were identified by 25% of youth as their primary paternal attachment figure (Table 2).

Table 3 displays rates of maltreatment by primary attachment figures as reported by youth in the Family Attachment Interview. The majority of youth reported some form of emotional neglect (95%), emotional abuse (88%), and physical abuse (69%). Only a small portion of youth reported sexual abuse by one of their primary attachment figures (7%)<sup>2</sup>. In general, girls reported more severe emotional, physical, and sexual abuse (see Table 3). These findings are in keeping with a growing body of literature examining parental maltreatment reported for children and adolescents demonstrating a range of emotional and behavioural difficulties (e.g., McGee, Wolfe, & Wilson, 1997; Rogosch, Cicchetti, & Aber, 1995; van der Kolk, Perry, & Herman, 1991).

### **Procedure**

Caregivers of youth were provided with information regarding the research project and limits of confidentiality at the time that their child was admitted to the program. Guardian consent was required for participation in a number of psychological assessments for the purpose of research and program evaluation. Youth were then

approached one to two weeks after admission to the program and invited to participate in the research project. The nature of their participation and limits of confidentiality were fully explained before they were asked for written consent. Their participation involved completing a variety of diagnostic, personality, and family assessment instruments, many of which were not included in the current study. Youth completed these instruments across a number of assessment sessions, each of which lasted for no longer than two hours. Youth also participated in a semi-structured interview conducted by a registered clinical psychologist and used to code attachment. All participants consented to the interviews being recorded and used for research purposes. Upon completion of all assessment sessions, youth were paid \$30.00 for their participation.

## **Measures**

### **Family Attachment Interview - Modified**

Each youth was administered a semi-structured psychology interview containing attachment-related questions from the Family Attachment Interview (Bartholomew & Horowitz, 1991). Participants were asked to describe their family history, structure, and relationships including their thoughts and feelings about their primary caregivers and themselves within these relationships. Youth also were asked to report on any experiences of emotional neglect or emotional, physical, or sexual abuse by their primary caregivers. Youth were asked to describe their experiences with both of their biological parents and any significant alternative caregivers (e.g., step-parents; foster parents; other relatives). Alternative caregivers were defined as any other adults whom they viewed as important in raising them at any point during their childhood. In many cases, youth currently were not residing with their primary caregivers, as noted in the above

description of participant demographics. All significant caregivers were considered, regardless of the youth's current living arrangement, when completing the following attachment coding system.

Participants' degree of correspondence to each of the four prototypic attachment patterns (secure, fearful, preoccupied, and dismissing) was rated on a scale ranging from 1 (no correspondence with the prototype) to 9 (excellent fit with the prototype). Linear combinations of the four prototype ratings were calculated in order to obtain scores for each of the two higher-order attachment dimensions (Griffin & Bartholomew, 1994b)<sup>3</sup>. This coding system has been well validated in various populations (e.g., Bartholomew & Horowitz, 1991; Griffin & Bartholomew, 1994a; Scharfe & Bartholomew, 1994) including a similar clinically referred sample of adolescents (Scharfe, 2002). In the current study all interviews were transcribed and coded by graduate students with advanced training in this coding system. Good to excellent inter-rater reliability was established with intraclass correlations ( $ICC_A$ ) ranging from .75 to .92 (see Appendix C for further details). Degree of emotional neglect, and emotional, physical, and sexual abuse by primary caregivers was also rated on a scale ranging from 1 (no abuse reported) to 9 (severe abuse reported). Excellent inter-rater reliability was established with intraclass correlations ( $ICC_A$ ) ranging from .81 to .97 (see Appendix C).

### **The Defense Mechanism Manual**

Youth were administered the Thematic Apperception Test (TAT), a projective storytelling technique. Standard TAT instructions were used (Murray, 1943)<sup>4</sup> and participants told stories to 10 TAT pictures (Cards 1, 2, 3BM, 4, 7GF, 12M, 13MF, 15, 17BM, and 18GF). These stories were transcribed and scored for the presence of denial,

projection, and identification using the Defense Mechanism Manual (Cramer, 1987; 1991). For each defense, there are seven categories representing different aspects of the defense (category descriptions are presented in Appendix A). Each category was scored as many times as it occurred in each story. The scores for each defense were then averaged across all valid stories, yielding one composite score for denial, projection and identification<sup>5</sup>.

This coding system has been well validated in various populations including with children, adolescents, adults, and psychiatric patients (e.g., Cramer, 1991; Cramer, Blatt, & Ford, 1988). Excellent inter-rater reliability was established in the current study with intraclass correlations ( $ICC_A$ ) ranging from .94 to .98. Finally, the unidimensional factor structure of the three defense mechanism composite scores was confirmed in the current study with basic principal components analyses<sup>6</sup>. Details are provided in Appendix C.

### **The Diagnostic Interview for Children and Adolescents – Revised**

The DICA-R-A (Reich, Shayka, & Taibleson, 1991) is a highly structured interview that assesses the presence or absence of symptoms indicative of the DSM-IV disorders of childhood and adolescence. Trained graduate students, using either the DICA-R-A or the more recent computerized version (DICA-IV), administered interview questions verbally to participants. Additional items were added to assess frequency and type of suicidal and intentional self-harming behaviour. All interview questions included in the current study were identical across the two versions of the DICA. Youth were systematically queried on the frequency, age of onset, clustering, and impact of various symptoms. For the purposes of the current study composite scores were calculated by

summing across symptom groups, rather than assigning youth to diagnostic categories<sup>7</sup>.

The current study examined the following groups of diagnostic symptoms:

1. Verbal aggression: A composite score including eight symptoms of oppositional defiant disorder (e.g., arguing with adults, blaming others for mistakes, easily annoyed by others). See Appendix C, Table C3, for a detailed list of symptoms.
2. Physical aggression: A composite score including five aggressive symptoms of conduct disorder (e.g., bullying, initiating physical fights, physical cruelty to others).<sup>8</sup>
3. Alcohol abuse: A composite score including 12 symptoms of alcohol abuse or dependence (e.g., alcohol use resulting in the failure to fulfill role obligations such as going to school; social, psychological, or physiological problems resulting from alcohol use).
4. Marijuana abuse: A composite score including the same 12 symptoms of substance abuse but with respect to marijuana use.
5. Suicidal behaviour: A four-point frequency scale for number of suicide attempts across the youth's lifetime (i.e., 0 = never; 1 = one attempt; 2 = two attempts; 3 = 3 or more attempts).
6. Self-harming behaviour: A four-point frequency scale for number of incidents of deliberate self-harming behaviour without suicidal intent (i.e., 0 = never; 1 = one or two times in lifetime; 2 = three to ten times in lifetime; 3 = one or more times per month over an extended period of time). Common examples of behaviours include superficial cutting, burning, or self-hitting.

## RESULTS

### Sample characteristics

Descriptive statistics for the attachment, defense mechanism, and risk-taking behaviour variables are presented in Table 4 (See Appendix D for complete inter-correlation matrices). Girls were found to have significantly higher ratings of anxious attachment,  $t(104) = -5.17, p < .001$ , whereas boys were rated significantly higher on the avoidant attachment dimension,  $t(104) = 3.63, p < .001$ . This sex difference was also reflected in higher preoccupied ratings for girls,  $t(104) = -4.15, p < .001$ , and higher dismissing ratings for boys,  $t(104) = 5.23, p < .001$ . There were no sex differences on the secure and fearful attachment scales. Not surprisingly for a clinical sample, the secure attachment scale was found to have a low mean relative to the insecure attachment scales and showed a restricted range.

With respect to defense mechanisms, boys were rated significantly higher on denial than girls,  $t(104) = 2.90, p = .005$ . Both sexes demonstrated higher scores for projection and denial than identification. These findings are consistent with prior research with clinical samples of adolescents and adults (Wells, Difillipo, & Hibbard, 1994; Hernandez, 1999)<sup>9</sup>.

Finally in terms of risk-taking behaviour<sup>10</sup>, girls reported more alcohol and marijuana abuse symptoms, suicide attempts, and self-harming behaviour, compared to boys ( $t(104) = -2.03, p < .05$ ;  $t(104) = -2.07, p < .05$ ;  $t(104) = -6.83, p < .001$ ;  $t(104) = -3.41, p < .01$ , respectively). This pattern of results is consistent with previous research documenting higher rates of psychiatric comorbidity or more severe psychopathology in



clinically referred females (e.g., Eme, 1992; Loeber and Keenan, 1994). No sex differences were found for verbal and physical aggression.

### **Data analytic plan**

The first objective of the current study was to examine the relations between insecure attachment and risk-taking behaviour using the two-dimensional model of attachment. This was accomplished by first examining the relations between attachment anxiety and attachment avoidance and behavioural functioning, then assessing the unique relation of each of the four attachment scales with behavioural functioning. The second objective was to examine the relations between attachment and defense mechanisms. This was also examined, first at the dimensional level (i.e., anxious and avoidant attachment), and second at the attachment scale level (i.e., secure, fearful, preoccupied, dismissing). The third objective was to examine the relations between defense mechanisms and risk-taking behaviour. This was examined both in terms of the direct relationships between defense mechanisms and behavioural functioning, as well as the possible mediating role of defense mechanisms on the relation between attachment and behavioural functioning.<sup>11</sup> Given that these hypotheses were established a priori, a bonferroni correction adjusting for the number of regression analyses was not performed.

### **Sex difference analyses**

The current study did not predict specific sex differences in the relationships between attachment, defense mechanisms, and risk-taking behaviour; however, the comparability of findings for girls and boys was examined in regression analyses. Sex was entered as a main effect into the first block of each regression with the predictor

variable(s). The sex by variable interaction(s) was entered into the second block with any other interaction variables. Only three interactions across 24 regression analyses were significant. Another five interactions were marginally significant. The difference between correlations for girls and boys was then tested using a Fisher's transformation and solving for the z statistic. Only three of the eight comparisons were significantly different. These findings are reported in the relevant sections below; however, they should be interpreted with caution due to potential familywise error rate problems.

### **Relations between attachment and behavioural functioning**

Tables 5, 6, and 7 present the zero-order correlations, semi-partial correlations, and regression analyses for attachment and risk-taking behaviour (i.e., verbal and physical aggression, alcohol and marijuana abuse symptoms, suicide attempts and self-harm behaviour).

#### **Attachment dimensions**

The first set of regression analyses examined the relation between attachment anxiety, attachment avoidance, and adolescent functioning. Anxiety and avoidance were entered into the first step of the equation and their interaction was entered into the second step. In no case was the anxious-avoidant interaction significant in predicting risk-taking behaviour.

Consistent with predictions, anxious attachment was significantly related to higher self-reports of verbal and physical aggression, and suicide attempts ( $\beta = .24, p < .05$ ;  $\beta = .22, p < .05$ ; and,  $\beta = .34, p = .001$ , respectively). Unexpectedly, anxious attachment was also significantly related to alcohol abuse symptoms ( $\beta = .24, p < .05$ )

and marginally associated with marijuana abuse symptoms ( $\beta = .17, p = .10$ ). These findings were consistent across zero-order correlations, semi-partial correlations, and regression analyses.

In general, avoidant attachment was not significantly related to risk-taking behaviour. Zero-order correlations did indicate, however, that avoidant attachment was marginally related to less frequent suicide attempts ( $r = -.19, p = .06$ ) and less self-harming behaviour ( $r = -.19, p = .06$ ). Additional analyses also revealed a marginal sex-by-avoidant attachment interaction in predicting marijuana abuse ( $\beta = .56, p = .07$ ). Separate analyses for girls and boys suggested that avoidant attachment was significantly related to more marijuana abuse symptoms for girls only ( $\beta = .29, p < .05$ ). This finding is consistent with the predicted relationship between avoidant attachment and substance abuse.

### **Individual attachment scales**

Zero-order correlations are presented Tables 5, 6, and 7. These results indicated that degree of secure attachment was significantly associated with less self-reported physical aggression ( $r = -.25, p < .01$ ) and marginally related to less verbal aggression ( $r = -.17, p = .09$ ). Degree of fearful attachment was significantly associated with more alcohol abuse symptoms ( $r = .20, p < .05$ ) and marginally related to more marijuana abuse symptoms ( $r = .18, p = .07$ ). Finally, the degree of fearful and preoccupied attachment was significantly related to more frequent suicide attempts ( $r = .23, p < .05$ ;  $r = .23, p < .05$ , respectively), whereas degree of dismissing attachment was related to fewer suicide attempts ( $r = -.35, p < .001$ ) and less self-harm behaviour ( $r = -.27, p < .01$ ). These findings are consistent with the predicted relationships between avoidant

attachment and substance abuse symptoms, and anxious attachment and suicidal behaviour.

Regression analyses were used to estimate the unique relations of each attachment scale with indicators of adolescent behavioural functioning; therefore, all four attachment scales were entered simultaneously. Results represent the unique relation of each attachment scale with the dependent variables controlling for the relations among the attachment scales.

First, regression analyses presented in Table 5, revealed that each of the insecure attachment scales, when controlling for the other attachment scales, was related to physical aggression (fearful  $\beta = .39, p < .05$ ; preoccupied  $\beta = .48, p < .05$ ; dismissing  $\beta = .43, p = .06$ )<sup>12</sup>. This finding seems inconsistent with the non-significant zero-order correlations between each of these attachment scales and aggression. One possible interpretation of this discrepancy is that overall attachment insecurity, rather than specific types of attachment, may be most predictive of physical aggression. In order to test this hypothesis, a score tapping overall degree of attachment insecurity was calculated (i.e., adding fearful, preoccupied, and dismissing scales). This insecure score was significantly correlated with more verbal ( $r = .19, p < .05$ ) and physical aggression ( $r = .33, p < .01$ ). It is noteworthy that this insecure score was not significantly correlated with any other risk taking behaviours.

As displayed in Tables 6 and 7, regression results predicting substance abuse symptoms and suicide attempts revealed a similar pattern of results to those observed in zero-order correlations. Specifically, degree of fearful attachment, controlling for the inter-correlations among the attachment scales, was related to more alcohol abuse

symptoms (fearful  $\beta = .35, p = .07$ ). Degree of fearful and preoccupied attachment, controlling for their inter-correlations, were related to more frequent suicide attempts ( $\beta = .37, p = .05$ ;  $\beta = .36, p = .08$ , respectively).

### **Relations between attachment and defense mechanisms**

Tables 8 and 9 present the zero-order correlations, semi-partial correlations, and regression analyses for attachment and defense mechanisms. First, with respect to the attachment dimensions, zero-order correlations indicated that attachment anxiety was marginally related to less denial ( $r = -.18, p = .07$ ) and that attachment avoidance was significantly related to less identification ( $r = -.23, p < .05$ ). There were no significant relations between the attachment dimensions and projection.

In the first set of regression analyses predicting scores on the defense mechanism measure (Table 8), attachment anxiety and avoidance were entered into the first step of the equation followed by their interaction term in the second step. Although the general pattern of results was consistent with the zero-order correlations, avoidant attachment was the only marginally significant finding in its relationship with lower identification ( $\beta = -.20, p = .06$ ). In no case was the anxious-avoidant interaction term significant in predicting defense mechanisms.

In the second set of regressions predicting scores on the defense mechanism measure (Table 9), all four attachment scales were entered simultaneously. First with respect to predicting denial, the zero-order correlation between dismissing attachment and denial was significant ( $r = .25, p < .01$ ), whereas regression results controlling for the other attachment scales were not significant ( $\beta = .23, p = .33$ ). These findings suggest

that the relation between dismissingness and denial may vary depending on the degree of other attachment scales present in the youth's attachment profile. Additional regression analyses also revealed a marginal sex-by-fearful attachment interaction predicting denial ( $\beta = -1.74, p = .06$ ). Separate analyses for girls and boys indicated that degree of fearful attachment was associated with less denial for girls only ( $\beta = -.50, p < .10; r = -.33, p < .05$ ). One possible interpretation of these findings is that for girls, degree of dismissing attachment is related to higher denial unless their profile is also characterized by a high degree of fearful attachment, which has the opposite association with denial.

With respect to attachment and projection, regression analyses indicated that all three insecure attachment scales were significantly related to projection when controlling for their inter-correlations (fearful  $\beta = .40, p < .05$ ; preoccupied  $\beta = .69, p = .001$ ; dismissing  $\beta = .66, p = .01$ ). Once again, an apparent discrepancy was observed between these results and the non-significant zero-order correlations for each of these attachment scales and projection. The score tapping overall degree of attachment insecurity (adding fearful, preoccupied, and dismissing scales) was significantly correlated with higher projection ( $r = .22, p < .05$ ). Thus, it may be interpreted from these findings that overall level of attachment insecurity is the strongest predictor of projection in this sample.

Finally, with respect to identification, preoccupied attachment was significantly related to higher identification, both controlling for the other attachment scales ( $\beta = .55, p = .01$ ) and when examined separately ( $r = .26, p < .01$ ).

## **Role of defense mechanisms in understanding risk-taking behaviour**

### **Direct relationships between defense mechanisms and behaviour**

To assess the unique relation of each defense mechanism to behavioural functioning, all three defense mechanism variables were entered simultaneously into each regression analysis. Results showed a significant relationship between projection and aggressive behaviour ( $\beta = .23, p < .05$  and  $r = .23, p < .05$  for verbal aggression;  $\beta = .22, p < .05$  and  $r = .19, p < .05$  for physical aggression; see Table 10). Denial was also found to be significantly associated with less frequent suicide attempts ( $\beta = -.28, p < .01$  and  $r = -.24, p < .05$ ; see Table 11). Further analyses revealed a significant sex-by-denial interaction predicting fewer suicide attempts ( $\beta = -.63, p < .05$ ). Separate analyses for girls and boys indicated that this association between denial and fewer suicide attempts was only significant for girls ( $\beta = -.32, p < .05$ ).

### **Mediating role of defense mechanisms**

The current study predicted three potential mediator models (see Figure 1). For the first model, results reported thus far show that the insecure attachment composite score is significantly related to projection ( $r = .22, p < .05$ ) and physical aggression ( $r = .33, p < .01$ ), and projection is associated with physical aggression ( $r = .19, p < .05$ ). The potential mediating role of projection was examined by entering the insecure composite score and projection simultaneously into the same regression analysis. As shown in Figure 2, current results did not support the proposed mediating role of projection between insecure attachment and aggression.

For the second model, degree of dismissing attachment was significantly related to denial ( $r = .25, p < .01$ ) but not substance abuse. Whereas degree of fearfulness was

significantly associated with alcohol abuse symptoms ( $r = .20, p < .05$ ) but not denial. These findings do not support the proposed mediating role of denial between avoidant attachment and substance abuse symptoms.

For the third model, results showed a significant association between preoccupied attachment and identification ( $r = .26, p < .01$ ) and more frequent suicide attempts ( $r = .23, p < .05$ ); identification was not, however, associated with suicide attempts ( $r = .08$ ). These findings do not support the proposed mediating role of identification between anxious attachment and suicidal behaviour.

Finally, as shown in Figure 2, an additional mediation model, which was not predicted in the current study, was tested based on results indicating that dismissing attachment was significantly related to denial ( $r = .25, p < .01$ ) and fewer suicide attempts ( $r = -.35, p < .001$ ), and that denial was associated with fewer suicide attempts ( $r = -.24, p < .05$ ). The regression analysis entering dismissing attachment and denial simultaneously, did not support a mediation effect (Figure 2).

In general, current results did not support the predicted mediating role of denial, projection, and identification between insecure attachment and risk-taking behaviour. Two possible interpretations are offered to account for these results. First, the current study may have lacked sufficient statistical power to identify significant mediation effects. Alternatively these results may suggest that attachment and defense mechanisms represent two related but separate processes that each contribute to our understanding of risk-taking behaviour.



## DISCUSSION

### **Insecure attachment and risk-taking behaviour**

The current research adopted an attachment theory perspective in examining the role of defense mechanisms in relation to adolescent risk-taking behaviour including aggression, substance abuse, suicide attempts, and deliberate self-harming behaviour. This research had three primary objectives: 1) to re-examine the relations between insecure attachment and risk-taking behaviour using the two-dimensional model of attachment (Bartholomew, 1990); 2) to examine the relations between anxious and avoidant attachment and defense mechanisms; and 3) to examine the role of defense mechanisms as mediators of the relations between attachment and risk-taking behaviour.

With respect to the first objective, the current research offers some new information regarding the complex relationships between attachment, aggression, substance abuse, and suicide attempts. As noted earlier, the advantage of the two-dimensional model of attachment is that individuals are characterized as approximating each of the four attachment prototypes to varying degrees, thus providing a multidimensional assessment of attachment patterns. Controlling for the inter-relationships among these attachment scales proved to be useful in the current research, particularly with respect to predicting aggressive behaviour.

First, the current findings lend support to the notion that degree of attachment insecurity is associated with physical aggression in youth. Results suggest that the combination of higher scores across the insecure scales (fearful, preoccupied, and dismissing) was the strongest predictor of aggression in this sample. These results offer support to previous findings showing a link between insecure parent-child attachment and

aggressive and violent behaviour in youth (Franke, 2000; Paternite & Shore, 2001; Leas & Mellor, 2000). These findings also support the notion that both anxious and avoidant attachment play a role in understanding aggressive behaviour in adolescents. The current results do not, however, support previously identified links between specific types of attachment patterns and aggression. For example, Rosenstein and Horowitz (1996) found that dismissing attachment in a psychiatrically hospitalized sample of adolescents was most predictive of conduct disorder, whereas Allen and colleagues (2002) have found that preoccupied attachment is most predictive of delinquency in public high school youth. I offer two possible interpretations of this disparity in findings. First, differences in findings may be related, at least in part, to characteristics of the samples of youth under investigation. The current sample consists of youth who report higher levels of parental maltreatment than is typically found in psychiatric inpatient or high school populations. Differences in findings could also be related to the attachment coding systems used in these studies. The two-dimensional model of attachment utilized in the current research distinguishes between fearful-avoidant and dismissing-avoidant attachment patterns. This distinction is not made within the categorical coding systems.

In addition to the insecure attachment scales, the two-dimensional model of attachment incorporates a separate secure scale. Although the scores on the secure scale were considerably lower than the scores on the insecure scales in this clinical sample, moderate scores were identified for some youth. Information coded on the secure scale included the presence of one or two positive *buffering* relationships (e.g., peer; alternative caregiver; professional), some level of awareness or *insight* by the youth about their view of self and others in their relationships, or appropriate attempts to improve their

relationships. Although these qualities of attachment security do not represent an overall pattern of secure attachment, they do appear to be important aspects of the youth's attachment profile. Current results showed that the secure scale was significantly associated with lower aggressive behaviour. These findings support the notion of potential benefits of having some *secure qualities* such as psychological insight or having a positive relationship outside of the primary parental attachment system. This interpretation is in keeping with the growing body of literature examining resiliency factors for children and adolescents in high-risk environments (e.g., Rutter, 2000).

With respect to attachment and substance abuse, degree of fearful attachment was significantly related to alcohol abuse and marginally related to marijuana abuse symptoms in the current sample. These findings offer some support for previous research linking both anxious and avoidant attachment to substance abuse in adolescents and adults (e.g., Allen, Hauser, & Borman-Spurrell, 1996; Cooper, Shaver, & Collins, 1998; Gardner, 1996; Gaylord-Young, 2003). One possible interpretation of the current findings is that substance abuse may function like a deactivating strategy for suppression of attachment-related distress characteristic of fearful attachment. Unfortunately, directly testing this interpretation is beyond the scope of this study. I recommend that future research examine the psychological functions that different substances may serve within the context of insecure attachment (e.g., reducing emotional distress; increasing social connectedness or group inclusion; social learning from attachment figures).

Finally, with respect to suicidal behaviour, the current research adds to the growing literature demonstrating associations between insecure or anxious attachment and suicidal behaviour (e.g., Adam, 1994; West, Spreng, Rose, & Adam, 1999; Wagner,

Silverman, & Martin, 2003). In the current sample, both degree of fearful and preoccupied attachment were associated with more frequent suicide attempts. Degree of dismissing attachment was associated with less frequent suicide attempts. The current study did not examine unresolved-disorganized attachment, which according to Adam, Sheldon-Keller, and West (1996) interacts with preoccupied attachment in its association with history of suicidality. It would be interesting in future studies to incorporate a measure of unresolved-disorganized attachment as a compliment to the two-dimensional coding system.

### **The contributing role of defense mechanisms**

#### **Attachment and predominant defense mechanisms used**

The second objective of the current research was to explore the relations between anxious and avoidant attachment and defense mechanisms. Overall, results indicated that level of attachment insecurity relates to greater use of projection. With respect to more specific attachment patterns, degree of preoccupied attachment was associated with greater use of identification, and degree of dismissing attachment was linked to more denial. These findings appear to fit well with the theoretical conceptualizations of preoccupied and dismissing attachment. These results are also consistent with the limited literature that is currently available supporting a link between dismissing attachment and higher use of denial (Strasser, 2002) and distancing defenses (Muderrisoglu, 1999), and between avoidant attachment and defensive deactivating strategies (Shaver & Mikulincer, 2005).

It is interesting to note that identification was not associated with positive outcomes such as higher levels of attachment security or lower levels of risk-taking

behaviour. This is in keeping with Cramer and Blatt's (1990) suggestion that higher scores on identification among individuals experiencing significant psychological disturbance may be indicative of a pathological form of identification. Future research could explore this possibility by incorporating measures addressing internalization of punitive standards or negative self-evaluations from attachment figures and affiliation with aggressive role models. These measures would need to be examined in relation to identification in both normative population and clinical samples in order to address this question.

### **Projection: Implications for current models of aggression**

Consistent with predictions, projection was associated with both verbal and physical aggression. Current findings support previous associations found between projection and oppositional behaviour (e.g., Cramer, 2002a). These results also lend support to psychoanalytic formulations of defensive processes in the development of aggression and violence (e.g., Wilson, 1999), as well as social-cognitive theories of hostile attribution biases and aggressive behaviour in adolescents (e.g., Simons, Paternite, & Shore, 2001). Psychoanalytic theory suggests that violent youth use various projective mechanisms in an attempt to manage overwhelming anxiety and helplessness by ridding the self of unacceptable wishes to hurt their caregivers (Campbell, 1996).

In comparing the current findings to social-cognitive theories, it is interesting to consider how the constructs of projection and hostile attribution bias may differ.

Projection, as it is measured here, incorporates the notion of attribution of hostile emotions or intentions to another person; however, it also includes features related to over-estimation or emotional reactivity to perceived threats of harm. Projection appears

to be a more broadly defined term that incorporates both cognitive and emotional components. These components have implications for clinical interventions as addressed in the discussion below.

### **Denial: A potential protective role in relation to suicide attempts**

Current findings revealed an interesting, though unexpected, negative relationship between denial and frequency of suicide attempts. An examination of the growing literature on clinical interventions for suicidal behaviour in adolescents (e.g., Katz, Cox, & Gunasekara, 2004; Rathus, & Miller, 2002) suggests that coping strategies that reduce awareness of intense emotional states can reduce the risk for suicidal behaviour. For example, denial may share a similar function with the *distress tolerance strategies* that are a component of Dialectical Behavior Therapy (DBT; Linehan, 1993). The primary distinction being that coping strategies are under the conscious control of the individual using them, whereas denial is conceptualized as an unconscious process (Cramer, 1998).

### **Preliminary examination of sex differences**

The current research identified a relatively small number of statistically significant sex differences, which require replication and, therefore are interpreted with caution. The small number of sex differences is striking in light of some sample differences with respect to higher rates of maltreatment, substance abuse, and self-harming behaviour reported by girls. This suggests that, for the most part, attachment and defense mechanisms operate similarly in girls and boys within this sample. The few sex differences found, however, do require some comment. First, the relation between avoidant attachment and more marijuana abuse symptoms was significantly stronger for girls than for boys. In addition, for girls only, degree of fearful attachment was associated

with lower denial, and denial was associated with fewer suicide attempts. This latter finding suggests that the potential protective function of denial, with respect to suicide attempts, may only be applicable to clinically referred girls. Taken together these findings suggest that girls who demonstrate higher levels of fearful attachment may be less likely to use denial as a defense, have greater difficulty suppressing their attachment related distress, and be at greater risk for suicide attempts.

### **Clinical implications**

The use of a clinically referred population of adolescents for the current study allows the findings to be generalized to other groups of youth who are referred for treatment of emotional and behavioural problems. Although the current results do not provide direct support for therapeutic outcomes, they do lend support to the attachment and defensive processes theorized to be involved in psychotherapy.

Results also suggest specific interventions that are most likely to influence youth's behavioural functioning. Such interventions might emphasize directly teaching more adaptive forms of the denial defense, like distress tolerance strategies (e.g., distraction, self-soothing, relaxation, imagery). Based on the current results, these strategies are most likely to be useful for girls who present with higher anxious attachment and risk for suicidal behaviour. Linehan (1993) and colleagues (e.g., Katz, Cox, & Gunasekara, 2004; Rathus, & Miller, 2002) have established an extensive literature on the effectiveness of distress tolerance strategies for reducing suicide attempts and deliberate self-harming behaviour.

Interventions aimed at reducing aggressive behaviour in adolescents may benefit from focusing on both the cognitive and emotional components of projection. These interventions may include strategies for addressing cognitive distortions related to hostile attributions, improving perspective-taking skills, and increasing awareness of emotional reactivity to perceived threats of harm or loss in relationships.

Given the level of attachment insecurity apparent in this clinical population of youth, it is also important to keep in mind that the above noted interventions would likely need to occur within the context of a supportive attachment relationship. This could occur through a variety of modalities including individual, group, or family therapy. Regardless of the modality, such interventions should offer a *corrective emotional experience*, direct modeling of more adaptive strategies for regulating attachment distress, and assisting parents in modeling these strategies to their adolescents. Emerging research on attachment-focused interventions suggests that Emotionally-Focused Family Therapy (Johnson & Lee, 2000), Attachment-Based Family Therapy (Diamond & Stern, 2003), and the Connect Parent Group (Moretti, Holland, Braber, Cross, & Obsuth, 2006) address many of the issues identified here.

### **Limitations and future directions**

The theoretical models of attachment and defense mechanisms offer a developmental perspective on risk-taking behaviour during adolescence. This study's design, however, was cross-sectional rather than longitudinal, limiting the developmental interpretations that can be made about the current findings. In addition, the clinical sample, although offering useful treatment implications, is a central limitation with respect to the generalizability of the current findings. The associations found here may



not reflect the relation of these constructs in normative population samples. With respect to sample selection procedures, the current study was unable to examine whether systematic differences may exist between those youth who declined to participate and those who agreed to participate in data collection. Although the proportion of youth who declined participation was relatively small (16% of youth admitted to the program), some caution is also warranted in generalizing the current findings to the entire population of adolescents admitted to this program.

As noted earlier, theorists and researchers (e.g., Anna Freud, 1965; Cramer, 1991) have emphasized the age appropriateness, balance (i.e., use of several defenses), and intensity of defense mechanisms in determining normality versus pathology. The current study attempted to address these issues in a number of ways. First, both developmentally immature (i.e., denial, and projection) and age appropriate (i.e., identification) defenses were examined within this adolescent sample. The current study did not find strong support for the theoretical postulation that developmentally immature defenses are more likely related to pathology. Additional measures may need to be used in future investigations to address issues of emotional maturity and appropriateness of immature defenses.

Second, the balance or relative use of each defense was examined in the current study through exploratory analyses. Proportional defense scores (e.g., total score for denial divided by the total score for all defenses) produced similar, though in some cases somewhat weaker, associations with risk-taking behaviours compared to analyses using average defense scores. These findings do not support the theoretical speculation that rigid use of a particular defense relative to other defenses will be associated with greater

pathology. In fact, the current research found that average level of projection, rather than its relative use, was most predictive of aggression. The current study did not, however, examine a broad range of defense mechanisms. It will be important for future research examining risk-taking behaviour to incorporate a broader range of defenses such as displacement, suppression, and anger turned toward the self.

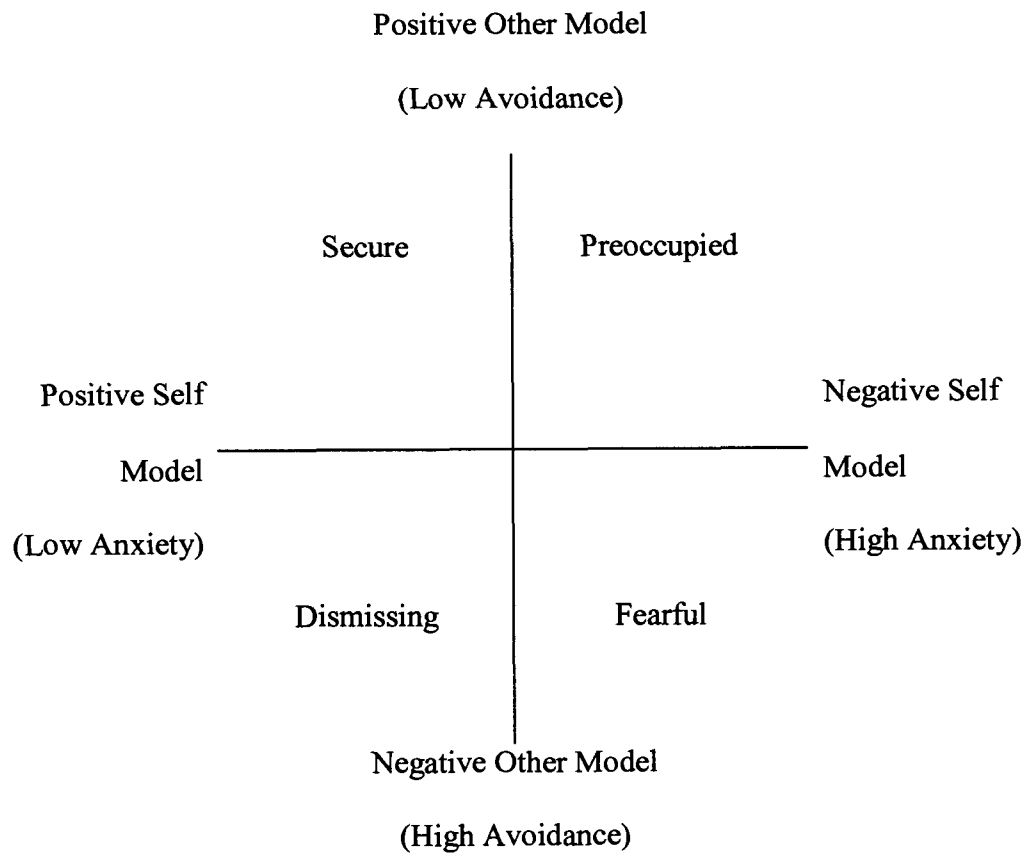
Finally, the intensity of each defense was operationalized as the average level of defense used (e.g., average number of times the defense occurred in each story). Although, the average proportion of defenses used in this sample (i.e., 51% projection; 29% denial; 20% identification) was similar to other clinical samples (e.g., Hernandez, 1999; Hibbard, et. al., 1994), the average level of defenses used was generally lower than that reported in these studies. I present two possible explanations here. First, according to theory, the function of a defense mechanism is to protect the individual from anxiety and emotional upset. The majority of youth assessed in the current study are experiencing considerable attachment-related stress as well as severe emotional and behavioural difficulties. Without assuming causality, it is conceivable that their lower level of defense use could be associated with their high levels of distress. This notion is in keeping with research suggesting that adolescent boys who used fewer defenses immediately following a traumatic event showed higher levels of psychological distress (Dollinger & Cramer, 1990).

A second possible explanation for the lower level of defense scores in the current sample has to do with test administration. The TAT is a projective test and as such, the examiner is part of the test stimuli. The current study attempted to control for potential confounding effects of different examiners by using standardized test instructions and

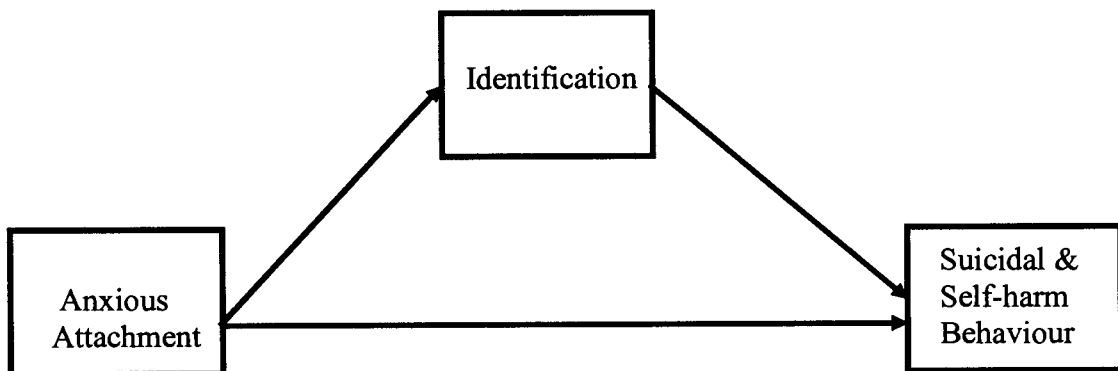
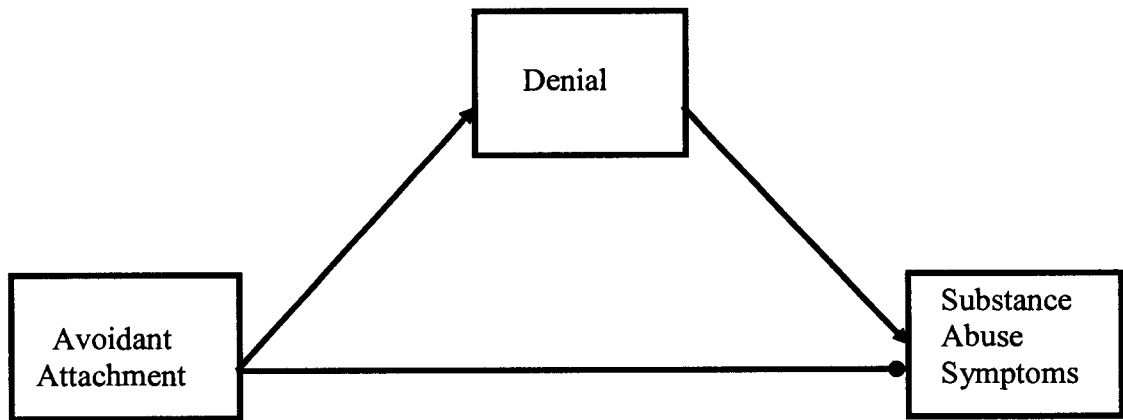
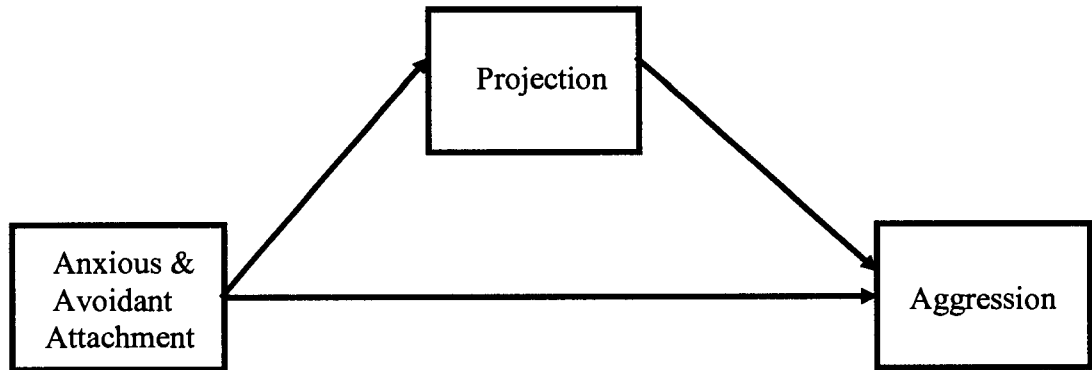
randomized assignment of examiners. Despite these precautions a small portion of protocols were identified, and excluded, due to administration difficulties (e.g., inconsistent prompting for further elaboration on stories). Neither, the overall length of stories, nor the number of prompts used by examiners appeared to influence the associations between the defenses and the other variables. It is conceivable, however, that subtle differences in test administration could have influenced the overall level of defenses used by participants. I recommend that future research utilizing the TAT incorporate more frequent training follow-up to prevent administration drift from standardized procedures.

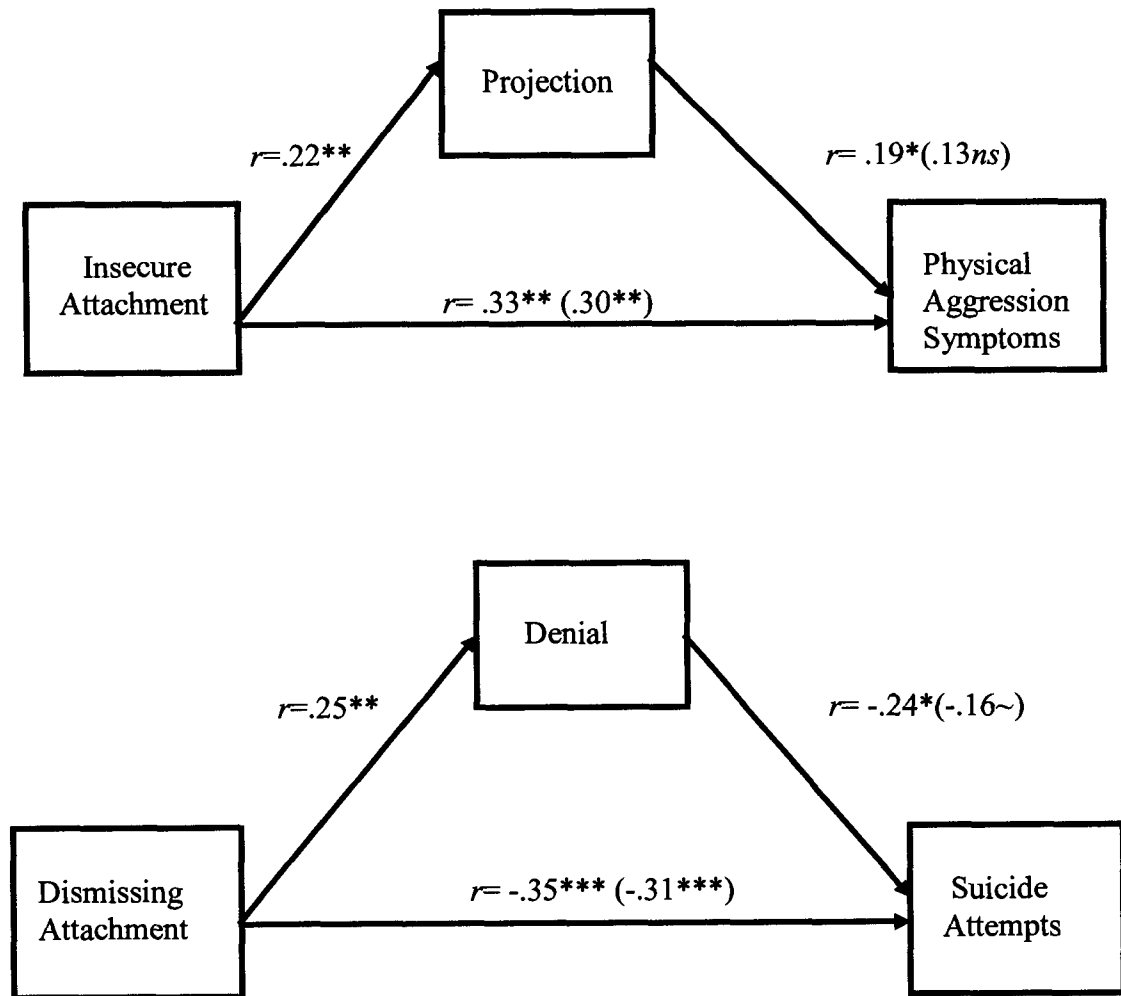
With respect to other measurement issues, the current research makes an important distinction between self-harming behaviour and suicide attempts. Whereas the measures used in this study assessed the severity and type of these behaviours, the psychological function of these behaviours was not examined. Recent research suggests that deliberate self-harming behaviour without suicidal intent may serve different functions compared to suicide attempts (Brown, Comtois, & Linehan, 2002). A growing body of literature suggests that intentional self-harm serves a variety of functions including emotional relief, distraction from problems, communicating with others, expressing anger, self-punishment, self-control, or generating feelings (e.g., Brown, Comtois, & Linehan, 2002; Chapman, Gratz & Brown, 2006; Laye-Gindhu & Schonert-Reichl, 2005; Nixon, Cloutier, & Aggarwal, 2002). It is possible that these various functions are associated with different patterns of attachment and defense mechanisms. Future research would benefit from a closer examination of these factors within the context of insecure attachment.

Despite the above noted limitations, this study contributes to the current literature examining insecure attachment, defensive processes, and risk-taking behaviour in a clinical sample of adolescents. In particular, this research links two theoretical approaches to helping us understand the interpersonal and intrapsychic processes that contribute to risk-taking behaviour in adolescents. This integration of theoretical perspectives and empirical results urges us to look beyond these behaviours to the protective function and motivations underlying their use. The current results are also relevant to the ongoing development of effective social-emotional interventions and future directions in research.

**Figure 1. Four-category model of adult attachment**

Source: Griffin & Bartholomew (1994)

**Figure 2. Proposed mediator models**

**Figure 3. Tested mediator models**

**Table 1. Reasons for exclusion from data collection or analytic procedures**

Variables	Total Sample		Males		Females	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
<u>Consecutive admissions (<i>n</i>=418) <sup>a</sup>:</u>						
Refusal to participate <sup>1</sup>	69	16	42	16	27	18
Intellectual deficits	25	6	14	5	11	7
Diagnostic issues <sup>2</sup>	16	4	11	4	5	3
Data matching procedures <sup>3</sup>	64	15	62	24	2	1
Time constraints <sup>4</sup>	28	7	10	4	18	12
Agreed to participate	216	52	125	47	91	59
<u>Youth who participated (<i>n</i>=216) <sup>b</sup>:</u>						
Excluded due to incomplete data <sup>5</sup>	55	25	32	25	23	25
Excluded due to technical <sup>6</sup> or administration <sup>7</sup> difficulties	55	25	35	25	20	22
Included in final sample	106	50	58	50	48	53

<sup>a</sup>  $\chi^2 (5, N = 418) = 43.85, p = .000$ . <sup>b</sup>  $\chi^2 (2, N = 216) = 0.85, ns$ .

<sup>1</sup> In most cases youth who declined to participate reported that they viewed the time commitment to complete the measures to be too lengthy (e.g., two to three assessment sessions, each of which lasted for no longer than two hours). In one case, the youth's parent declined to have their child participate in the research project.

<sup>2</sup> Diagnostic issues include developmental disorders (i.e., Autism), acute psychosis or thought disorder, and significant language difficulties (i.e., selective mutism, not fluent in English).

<sup>3</sup> In order to collect a relatively equal number of male and female youth, participants were matched on age and gender. Youth who did not have a matching counterpart were not approached to participate.

<sup>4</sup> Some youth were not approached to participate due to insufficient time to complete data collection procedures (e.g., brief admission to the response program).

<sup>5</sup> Youth failed to complete one or more of the required measures for the current analyses (e.g., declined to complete the attachment interview, diagnostic interview, and/or Thematic Apperception Test).

<sup>6</sup> Technical difficulties refer to problems with audio recording equipment (*n*=51). Both the attachment interview and the Thematic Apperception Test required audio recording for transcription and coding purposes.

<sup>7</sup> Administration difficulties refer to the rare occurrences when the examiner or subject failed to follow standardized test instructions (*n*=4). In two cases the examiner offered an unusually high number of queries or prompts for further story elaboration which, according to the standard TAT instructions (Murray, 1943), invalidated the test protocol. In two other cases the youth offered inappropriate responses to all TAT cards thus invalidating the test protocol (e.g., describing extremely violent scenes from a cartoon rather than generating their own stories in response to the cards).



**Table 2. Demographic characteristics of the sample**

Variables	Total Sample		Males		Females	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Ethnic Group <sup>a</sup>						
Caucasian	74	80	46	92	28	67
Aboriginal	9	10	1	2	8	19
Other groups	9	10	3	6	6	14
Living Arrangement <sup>b</sup>						
Biological parents	63	62	41	74	22	48
Foster or group home care	28	28	11	20	17	37
Adoptive parents	2	2	2	4	0	0
Relative or other facilities	8	8	1	2	7	15
Primary Maternal Figure <sup>c</sup>						
Biological	87	85	51	89	36	82
Adoptive	4	4	2	3	2	4.5
Step-parent	4	4	2	3	2	4.5
Relative	5	5	1	2	4	9
Foster parent or staff	2	2	2	3	0	0
Primary Paternal Figure <sup>d</sup>						
Biological	62	66	39	71	23	58
Adoptive	3	3	2	3	1	2.5
Step-parent	25	26	12	22	13	32
Relative	2	2	1	2	1	2.5
Foster parent or staff	1	1	1	2	0	0
No one identified	2	2	0	0	2	5

*Note.* Samples sizes vary due to missing data on some variables.

<sup>a</sup>  $\chi^2(2, N = 92) = 10.20, p < .01.$

<sup>b</sup>  $\chi^2(3, N = 101) = 12.82, p < .01.$

<sup>c</sup>  $\chi^2(4, N = 102) = 4.55, ns.$

<sup>d</sup>  $\chi^2(5, N = 95) = 5.27, ns.$

**Table 3. Maltreatment by primary parental attachment figures as reported by youth on the Family Attachment Interview**

Variables	Total Sample		Males		Females	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Emotional Neglect <sup>a</sup>						
None reported	5	5	2	3	3	6
Mild to moderate range	38	36	22	38	16	33
Moderate to severe range	63	59	34	59	29	61
Emotional Abuse <sup>b</sup>						
None reported	12	12	8	15	4	8
Mild to moderate range	38	37	25	45	13	28
Moderate to severe range	52	51	22	40	30	64
Physical Abuse <sup>c</sup>						
None reported	33	31	22	39	11	23
Mild to moderate range	36	35	20	36	16	33
Moderate to severe range	35	34	14	25	21	44
Sexual Abuse <sup>d</sup>						
None reported	95	93	54	98	41	87
Mild, moderate or severe	7	7	1	2	6	13

*Note.* Samples sizes vary due to missing data on some variables.

<sup>a</sup>  $\chi^2(2, N = 106) = 0.61, ns.$

<sup>b</sup>  $\chi^2(2, N = 102) = 5.76, p = .05.$

<sup>c</sup>  $\chi^2(2, N = 104) = 4.93, p = .08.$

<sup>d</sup>  $\chi^2(1, N = 102) = 4.75, p < .05.$

**Table 4. Descriptive statistics for males, females, and all participants**

Variables	Total Sample			Males		Females	
	<i>M</i>	<i>SD</i>	Skewness	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Age	14.52	1.23	-.002	14.44	1.26	14.61	1.19
Anxious Attachment	2.40	3.16	-0.83	1.11 <sub>c</sub>	3.35	3.97 <sub>c</sub>	2.06
Avoidant Attachment	1.23	3.29	-0.26	2.22 <sub>c</sub>	3.18	0.02 <sub>c</sub>	3.03
Secure scale	2.43	0.97	0.91	2.39	1.00	2.47	0.93
Fearful scale	4.24	1.33	-0.13	4.06	1.32	4.46	1.32
Preoccupied scale	3.82	1.50	0.40	3.31 <sub>c</sub>	1.46	4.44 <sub>c</sub>	1.32
Dismissing scale	3.23	1.54	1.06	3.87 <sub>c</sub>	1.64	2.47 <sub>c</sub>	0.94
Denial defense	.38	.24	0.89	.44 <sub>b</sub>	.24	.31 <sub>b</sub>	.22
Projection defense	.64	.37	0.59	.67	.39	.59	.33
Identification defense	.27	.21	0.82	.27	.22	.26	.20
Verbal aggression	4.09	2.34	-0.16	3.77	2.24	4.48	2.42
Physical aggression	1.33	1.48	1.01	1.26	1.34	1.42	1.65
Alcohol symptoms	3.29	4.00	0.81	2.59 <sub>a</sub>	3.58	4.15 <sub>a</sub>	4.35
Marijuana symptoms	3.65	4.00	0.61	2.93 <sub>a</sub>	3.63	4.52 <sub>a</sub>	4.28
Suicide attempts	.83	1.14	1.02	0.26 <sub>c</sub>	0.58	1.53 <sub>c</sub>	1.27
Self-harm behaviour	.85	1.23	0.94	0.49 <sub>b</sub>	1.00	1.28 <sub>b</sub>	1.35

*Note.* Means denoted with subscripts differ significantly at the following *p* values:  
<sub>a</sub>*p* < .05; <sub>b</sub>*p* < .01; <sub>c</sub>*p* < .001;

**Table 5. Summary of regression analyses for attachment predicting verbal and physical aggression symptoms**

Variable	<i>Adj R<sup>2</sup></i>	<i>r</i>	$\beta$	<i>sr</i>	<i>p</i> value
DV = Verbal Aggression					
<u>Attachment Dimensions:</u>	.03				.07
Anxious		.19*	.24	.22	.02
Avoidant		.04	.13	.12	.22
<u>Attachment Scales:</u>	.02				.22
Secure		-.17~	-.10	-.06	.54
Fearful		.15	.19	.10	.32
Preoccupied		.08	.16	.07	.48
Dismissing		-.07	.05	.02	.84
DV = Physical Aggression					
<u>Attachment Dimensions:</u>	.03				.07
Anxious		.16~	.22	.20	.08
Avoidant		.07	.16	.14	.14
<u>Attachment Scales:</u>	.08				.02
Secure		-.25**	.01	.01	.95
Fearful		.10	.39	.19	.04
Preoccupied		.13	.48	.21	.02
Dismissing		.04	.43	.18	.06

~  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$ .

**Table 6. Summary of regression analyses for attachment predicting substance abuse symptoms**

Variable	<i>Adj R</i> <sup>2</sup>	<i>r</i>	$\beta$	<i>sr</i>	<i>p</i> value
DV = Alcohol symptoms					
<u>Attachment Dimensions:</u>	.03				.07
Anxious		.19*	.24	.22	.02
Avoidant		.04	.13	.12	.22
<u>Attachment Scales:</u>	.03				.17
Secure		-.10	.05	.03	.74
Fearful		.20*	.35	.17	.07
Preoccupied		.06	.26	.12	.22
Dismissing		-.10	.18	.07	.45
DV = Marijuana symptoms					
<u>Attachment Dimensions:</u>	.007				.26
Anxious		.14	.17	.16	.10
Avoidant		.01	.08	.07	.45
<u>Attachment Scales:</u>	.001				.40
Secure		-.01	.07	.04	.68
Fearful		.18~	.24	.12	.21
Preoccupied		.01	.12	.05	.59
Dismissing		-.12	.05	.02	.84

~*p* < .10; \**p* < .05.

**Table 7. Summary of regression analyses for attachment predicting suicide attempts and other self-harming behaviour**

Variable	<i>Adj R</i> <sup>2</sup>	<i>r</i>	$\beta$	<i>sr</i>	<i>p</i> value
DV = Suicide attempts					
<u>Attachment Dimensions:</u>	.12				.001
Anxious		.36***	.34	.32	.001
Avoidant		-.19~	-.06	.06	.52
<u>Attachment Scales:</u>	.13				.001
Secure		.04	.16	.09	.31
Fearful		.23*	.37	.19	.05
Preoccupied		.23*	.36	.16	.08
Dismissing		-.35***	.01	.01	.95
DV = Self-harm behaviour					
<u>Attachment Dimensions:</u>	.03				.07
Anxious		.19~	.14	.13	.19
Avoidant		-.19~	-.14	-.13	.19
<u>Attachment Scales:</u>	.06				.04
Secure		.17~	.28	.16	.09
Fearful		.12	.28	.14	.15
Preoccupied		.13	.27	.12	.21
Dismissing		-.27**	.06	.03	.79

~*p* < .10; \**p* < .05; \*\**p* < .01; \*\*\**p* < .001.

**Table 8. Summary of regression analyses for attachment dimensions predicting defense mechanisms**

Variable	<i>Adj R</i> <sup>2</sup>	<i>r</i>	$\beta$	<i>sr</i>	<i>p</i> value
DV = Denial Defense					
<u>Attachment Dimensions:</u>	.02				.15
Anxious		-.18~	-.15	-.13	.17
Avoidant		.14	.08	.08	.44
DV = Projection Defense					
<u>Attachment Dimensions:</u>	-.01				.76
Anxious		.05	.03	.02	.81
Avoidant		-.07	-.06	-.06	.57
DV = Identification Defense					
<u>Attachment Dimensions:</u>	.04				.05
Anxious		.16~	.09	.08	.41
Avoidant		-.23*	-.20	-.18	.06

~  $p < .10$ ; \*  $p < .05$ .

**Table 9. Summary of regression analyses for attachment scales predicting defense mechanisms**

Variable	<i>Adj R<sup>2</sup></i>	<i>r</i>	$\beta$	<i>sr</i>	<i>p</i> value
DV = Denial Defense					
<u>Attachment Scales:</u>	.04				.10
Secure		-.13	-.07	-.04	.69
Fearful		-.13	-.06	-.03	.76
Preoccupied		-.07	.03	.01	.89
Dismissing		.25**	.23	.09	.33
DV = Projection Defense					
<u>Attachment Scales:</u>	.07				.02
Secure		-.07	.28	.17	.07
Fearful		-.08	.40	.20	.04
Preoccupied		.18~	.69	.31	.001
Dismissing		.06	.66	.27	.01
DV = Identification Defense					
<u>Attachment Scales:</u>	.06				.04
Secure		.06	.27	.16	.09
Fearful		-.05	.28	.14	.14
Preoccupied		.26**	.55	.25	.01
Dismissing		-.15	.33	.13	.16

~  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$ .



**Table 10. Summary of regression analyses for defense mechanisms predicting aggression and substance abuse symptoms**

Variable	<i>Adj R</i> <sup>2</sup>	<i>r</i>	$\beta$	<i>sr</i>	<i>p</i> value
DV = Verbal Aggression <sup>a</sup>					
<u>Defense Mechanisms:</u>	.03				.12
Denial		-.06	-.06	-.07	.49
Projection		.23*	.23	.23	.02
Identification		.03	.01	.01	.95
DV = Physical Aggression					
<u>Defense Mechanisms:</u>	.03				.12
Denial		-.09	-.09	-.09	.35
Projection		.19*	.22	.21	.03
Identification		-.05	-.08	-.07	.45
DV = Alcohol symptoms					
<u>Defense Mechanisms:</u>	-.01				.61
Denial		.13	.13	.13	.20
Projection		.02	.00	.00	.97
Identification		.04	.01	.01	.95
DV = Marijuana symptoms					
<u>Defense Mechanisms:</u>	.01				.25
Denial		-.11	-.07	-.07	.50
Projection		-.11	-.08	-.08	.43
Identification		-.17~	-.13	-.13	.19

~ *p* < .10; \* *p* < .05.

**Table 11. Summary of regression analyses for defense mechanisms predicting suicide attempts and other self-harming behaviour**

Variable	<i>Adj R</i> <sup>2</sup>	<i>r</i>	$\beta$	<i>sr</i>	<i>p</i> value
DV = Suicide attempts					
<u>Defense Mechanisms:</u>	.06				.03
Denial		-.24*	-.28	-.27	.005
Projection		.10	.09	.09	.34
Identification		.08	.14	.13	.18
DV = Self-harm behaviour					
<u>Defense Mechanisms:</u>	.02				.18
Denial		-.14	-.19	-.18	.07
Projection		.06	.04	.04	.68
Identification		.12	.16	.15	.13

\*  $p < .05$ .

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## APPENDICES

### Appendix A

#### The Defense Mechanism Manual Scoring Criteria:

Cramer (1987, 1991, 1999) designed seven categories to represent a developmental continuum within each defense, from the developmentally earliest to more mature forms of the defense. The categories for each defense are as follows:

#### **Denial**

Definition: Failure of the perceptual system to see what exists in reality.

#### Immature Components:

- (1) Omission of major characters or objects: Withdrawing attention from external stimuli or ignoring reality (e.g., failure to perceive threatening objects).
- (2) Misperception: Attempt to change perception so that it becomes less painful by re-interpreting the meaning of events.
- (3) Reversal: Changing the threatening event into its opposite (e.g., affective reversal changes rage into laughter).
- (4) Statements of negation: Anxiety-arousing events may be perceived but only in negated form (e.g., the experience of terror is changed into "I'm not afraid").
- (5) Denial of reality: Attempts to avoid perception of anxiety-arousing events (e.g., sleeping; daydreaming; fainting; avoiding looking at, hearing, or thinking about something that is unpleasant).

#### Mature Components:

- (6) Overly maximizing the positive or minimizing the negative: Changing perception so that positive aspects of the event are over-exaggerated or anxiety-arousing events are minimized.
- (7) Unexpected goodness, optimism, positiveness, or gentleness: Unfounded optimism in the face of objective failure may be understood as a result of the substitution of a personal fantasy for objective reality.

### **Projection**

**Definition:** Attribution of unacceptable feelings, wishes, and impulses to someone else.

**Immature Components:**

- (1) Hostile attributions: Characters described with hostile feelings or intentions without sufficient reason, or with other feelings or intentions that are normatively unusual for the situation.
- (2) Additions of ominous people, animals, objects, or qualities: Events are experienced as more negative or ominous than they are in objective reality.
- (3) Magical, circumstantial, or animistic thinking: Generalization of one's own thoughts, feelings, or self-image onto others (e.g., assuming animals or objects "think like" oneself).

**Mature Components:**

- (4) Protection: Concern for protection from perceived external threat.
- (5) Death, injury or assault: Concern with disarming, capturing, or destroying the perceived danger.
- (6) Escape: Concern with being pursued, captured, or escaping from imagined threat.
- (7) Bizarre story or theme: Circumstantial or bizarre explanations for events are developed to account for perceived threats.

### **Identification**

**Definition:** Modifying the self in order to increase one's resemblance to a model through the internalization of both the regulations and characteristics of the other.

**Immature Components:**

- (1) Emulation of the skills: Character imitating, taking over, or acquiring a skill or talent of another character.
- (2) Emulation of characteristics: Character imitating, taking over, or acquiring a characteristic, quality, or attitude of another character.

**Mature Components:**

- (3) Regulation of behaviour: Identifying standards and societal rules for regulating behaviour including rebellion against these rules and self-criticism or punishment for failing to achieve these standards.
- (4) Affiliation: Success or self-esteem through affiliation with others.
- (5) Delay of gratification: Working hard for delayed rewards in order to regulate impulses/behaviour.
- (6) Role differentiation: Identifying characters in specific adult roles (e.g., job title; specific relationship such as husband or wife).
- (7) Moralism: Providing an outcome in which good conquers evil, a moral lesson is learned, or wrongdoings are punished by an authority figure (e.g., teacher, judge, police).

## Appendix B

**Table B1. Demographic characteristics of samples collected during two time periods**

Variables	September 1997 to February 1999		March 2003 to December 2005	
	<i>f</i>	%	<i>f</i>	%
<b>Ethnic Group</b>				
Caucasian	38	80	36	82
Aboriginal	5	10	4	9
Other groups	5	10	4	9
<b>Current Living Arrangement<sup>a</sup></b>				
Biological parents	36	58	27	69
Foster or group home care	23	37	5	13
Adoptive parents	2	3	0	0
Relative or other facilities	1	2	7	18
<b>Primary Maternal Caregiver</b>				
Biological	53	85	34	85
Adoptive	3	5	1	3
Step-parent	1	2	3	7
Relative	3	5	2	5
Foster parent or staff	2	3	0	0
<b>Primary Paternal Caregiver</b>				
Biological	43	69	19	58
Adoptive	3	5	0	0
Step-parent	14	22	11	33
Relative	1	2	1	3
Foster parent or staff	1	2	0	0
No one identified	0	0	2	6

<sup>a</sup>  $\chi^2(3, N = 101) = 14.89, p = .002$ .

**Table B2. Maltreatment by primary attachment figures as reported by youth in samples collected during two time periods**

Variables	September 1997 to February 1999		March 2003 to December 2005	
	<i>f</i>	%	<i>f</i>	%
<b>Emotional Neglect<sup>a</sup></b>				
None reported	5	8	0	0
Mild to moderate range	27	44	11	25
Moderate to severe range	30	48	33	75
<b>Emotional Abuse</b>				
None reported	9	15	3	7
Mild to moderate range	23	39	15	35
Moderate to severe range	27	46	25	58
<b>Physical Abuse</b>				
None reported	16	26	17	40
Mild to moderate range	26	43	10	23
Moderate to severe range	19	31	16	37
<b>Sexual Abuse</b>				
None reported	57	95	38	90
Mild, moderate or severe	3	5	4	10

<sup>a</sup>  $\chi^2 (2, N = 106) = 9.09, p = .01$ .

**Table B3. Descriptive statistics for samples collected during two time periods**

Variables	September 1997 to February 1999		March 2003 to December 2005	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Age	14.61	1.34	14.38	1.04
Anxious Attachment	1.79 <sub>a</sub>	3.39	3.27 <sub>a</sub>	2.62
Avoidant Attachment	1.31	3.70	1.11	2.64
Secure scale	2.53	1.08	2.28	.77
Fearful scale	4.08	1.38	4.48	1.24
Preoccupied scale	3.76	1.65	3.91	1.28
Dismissing scale	3.52 <sub>a</sub>	1.76	2.83 <sub>a</sub>	1.05
Denial defense	.44 <sub>a</sub>	.27	.32 <sub>a</sub>	.16
Projection defense	.71 <sub>b</sub>	.39	.53 <sub>b</sub>	.29
Identification defense	.34 <sub>c</sub>	.22	.17 <sub>c</sub>	.15
Verbal aggression	3.90	2.39	4.36	2.26
Physical aggression	1.45	1.48	1.16	1.49
Alcohol symptoms	3.10	3.88	3.57	4.21
Marijuana symptoms	3.31	3.91	4.13	4.11
Suicide attempts (4-point)	.82	1.13	.84	1.16
Self-harm (4-point scale)	.87	1.21	.82	1.26

*Note.* Means denoted with subscripts differ significantly at the following *p* values:

<sub>a</sub>*p* < .05; <sub>b</sub>*p* < .01; <sub>c</sub>*p* < .001;



**Table B4. Correlations between defense mechanisms and all other variables for samples collected during two time periods**

Variables	September 1997 to February 1999 ( <i>n</i> =62)			March 2003 to December 2005 ( <i>n</i> =44)		
	Denial	Projection	Identify	Denial	Projection	Identify
Anxious Attachment	-.11	.05	.35**	-.17	.28	.09
Avoidant Attachment	.13	-.06	-.29*	.15	-.13	-.18
Secure scale	-.24~	-.07	-.02	.07	-.20	.11
Fearful scale	-.15	-.08	.03	.02	.04	-.03
Preoccupied scale	-.02	.16	.36**	-.20	.31*	.16
Dismissing scale	.23~	.04	-.30*	.16	-.13	-.15
Verbal aggression	.01	.26*	.07	-.15	.26~	.08
Physical aggression	-.06	.20	-.12	-.29~	.14	-.07
Alcohol symptoms	.17	.04	.03	.14	.02	.15
Marijuana symptoms	-.15	-.16	-.20	.04	.03	-.02
Suicide frequency	-.21~	.10	.15	-.34*	.10	-.01
Self-harm frequency	-.12	.10	.18	-.25~	-.02	.02

*Note.* The difference between correlations in the two samples was tested using a Fisher's transformation and solving for the *z* statistic. None of the comparisons were significantly different.

*p* values of individual correlations are denoted by the following:  
~ *p* < .10; \* *p* < .05; \*\* *p* < .01; \*\*\* *p* < .001.

### Appendix C

**Table C1. Inter-rater reliability for defense mechanisms, attachment, and parental maltreatment scoring**

Variables	Single Measure Intraclass Correlation (ICC <sub>A</sub> )
<u>Defense Mechanisms<sup>a</sup></u>	
Denial	.94
Projection	.98
Identification	.98
<u>Attachment Scales<sup>b</sup></u>	
Secure scale	.75
Fearful scale	.80
Preoccupied scale	.92
Dismissing scale	.84
Anxious dimension (composite)	.88
Avoidant dimension (composite)	.86
<u>Maltreatment Scales<sup>c</sup></u>	
Emotional neglect	.81
Emotional abuse	.87
Physical abuse	.87
Sexual abuse	.97

<sup>a</sup> n=20; <sup>b</sup> n=40; <sup>c</sup> n=20

**Table C2. Principal components analyses of the defense mechanism items**

Variables	Factor Loadings		
	Denial <sup>a</sup>	Projection <sup>b</sup>	Identification <sup>c</sup>
<u>Defense Mechanisms:</u> <sup>1</sup>			
Card 1	.09 <sup>a</sup>	.31(.32)	.61
Card 3BM	.42(.43)	.71(.71)	.51
Card 4	.52(.53)	.37(.36)	.30
Card 13MF	.61(.60)	.38(.38)	.38
Card 15	.21(.21)	-.06 <sup>b</sup>	.14
Card 2	.41(.41)	.44(.45)	.58
Card 17BM	.58(.58)	.26(.28)	.25
Card 7GF	.44(.44)	.70(.70)	.31
Card 12M	.24(.25)	.51(.51)	.24
Card 18GF	.47(.48)	.19(.20)	.45

<sup>a</sup> One item dropped from further analyses. After dropping this item: Values in parentheses represent new factor loadings; Factor 1 eigenvalue = 1.85; Factor 1 variance accounted for = 18.51%.

<sup>b</sup> One item dropped from further analyses. After dropping this item: Values in parentheses represent new factor loadings; Factor 1 eigenvalue = 1.93; Factor 1 variance accounted for = 19.36%.

<sup>c</sup> All items were retained for further analyses. Factor 1 eigenvalue = 1.67; Factor 1 variance accounted for = 16.40%.

<sup>1</sup> TAT cards are listed in order of administration. The choice of cards for administration was based on previous research (Cramer 1991; 1997; 1999). Current analyses revealed that Cards 1 and 15 were not helpful in the measurement of denial or projection. It is noteworthy that these two cards do not depict an interpersonal situation that may have affected their utility for assessing these defenses. With respect to the identification scale, Card 1 tends to assess themes related to parental expectations/rules and Card 15 tends to assess themes related to relationship loss; both of which are relevant to identification and likely improved their utility for assessing this scale. Although multiple factors are needed to account for all of the variance within the three defense variables, in each case one factor was found to be sufficient in order to justify creating one composite score for each variable. The means substitution method was used for dealing with missing items due to uncodable stories; however, the listwise method of excluding cases based on missing data offered comparable results with the exception of one additional card not loading well on the denial and identification scales.

**Table C3. Principal components analysis of DICA aggression items**

Variables	Rotated Factor Loadings <sup>1</sup>	
	1. Verbal Aggression <sup>a</sup>	2. Physical Aggression <sup>b</sup>
<u>Oppositional Defiant Disorder:</u>		
Loses temper	.66	.16
Argues with adults	.67	.09
Defiant	.57	.03
Annoys others	.49	.11
Blames others	.42	.06
Easily annoyed by others	.85	-.23
Angry or resentful	.68	-.05
Spiteful or vindictive	.52	.14
<u>Conduct Disorder:</u>		
Bullying	.21	.53
Initiates Fights	.08	.66
Fights with weapons	.09	.68
Physically cruel to people	-.01	.76
Mugging	-.12	.74

<sup>a</sup> Factor 1: Eigenvalue = 4.38; Variance accounted for = 33.67%.

<sup>b</sup> Factor 2: Eigenvalue = 1.36; Variance accounted for = 10.49%.

<sup>1</sup> Given the expected correlation between verbal and physical aggression, an oblique rotation (direct oblimin method) was used which allows the factors to correlate. Although multiple factors are required to account for all of the variance among the items, a two factor solution accounted for enough variance (44.16%) while maintaining interpretability of the factors.

## Appendix D

**Table D1. Inter-correlations among attachment variables and between attachment, defense mechanisms, and risk-taking behaviour**

Variables	1. Anx	2. Av	3. Sec	4. Fear	5. Pre	6. Dis
1. Anxious Attachment	--	--	--	--	--	--
2. Avoidant Attachment	-.38***	--	--	--	--	--
3. Secure scale	-.29**	-.48***	--	--	--	--
4. Fearful scale	.51***	.44***	-.21*	--	--	--
5. Preoccupied scale	.65***	-.80***	-.10	-.29**	--	--
6. Dismissing scale	-.79***	.67***	-.31**	-.34***	-.55***	--
Denial defense	-.18~	.14	-.13	-.13	-.07	.25**
Projection defense	.05	-.07	-.07	-.08	.18~	.06
Identification defense	.16~	-.23*	.06	-.05	.26**	-.15
Verbal aggression	.19*	.04	-.17	.15	.08	-.07
Physical aggression	.16~	.07	-.25**	.10	.13	.04
Alcohol symptoms	.19*	.04	-.10	.20*	.06	-.10
Marijuana symptoms	.14	.01	-.01	.18~	.01	-.12
Suicide frequency	.36***	-.19~	.04	.23*	.23*	-.35***
Self-harm frequency	.19~	-.19~	.17~	.12	.13	-.27**

~  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

**Table D2. Inter-correlations among defense mechanism variables and between defense mechanisms and risk-taking behaviour variables**

Variables	1. Denial	2. Projection	3. Identification
1. Denial defense	--	--	--
2. Projection defense	.09	--	--
3. Identification defense	.25*	.21*	--
Verbal aggression	-.06	.23*	.03
Physical aggression	-.09	.19*	-.05
Alcohol symptoms	.13	.02	.04
Marijuana symptoms	-.11	-.11	-.17~
Suicide frequency	-.24*	.10	.08
Self-harm frequency	-.14	.06	.12

~  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

**Table D3. Inter-correlations among risk-taking behaviour variables**

Variables	1. Verbal	2. Physical	3. Alc.	4. Mar.	5. Suicide
1. Verbal aggression	--	--	--	--	--
2. Physical aggression	.54***	--	--	--	--
3. Alcohol symptoms	.25*	.46***	--	--	--
4. Marijuana symptoms	.17~	.36***	.65***	--	--
5. Suicide frequency	.16~	.30**	.37***	.38***	--
6. Self-harm frequency	.13	.15	.09	.28**	.51***

~  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

## Appendix E

**Table E1. Summary of logistic regression analyses for attachment predicting suicidal and self-harming behaviour**

DV = Suicide attempts							
<u>Dimensions:</u> <sup>a</sup>	<i>B</i>	<i>p</i> value	<i>SE</i>	<u>Scales:</u> <sup>b</sup>	<i>B</i>	<i>p</i> value	<i>SE</i>
Anxious	.30	.001	.09	Secure	.26	.50	.38
Avoidant	.00	.97	.07	Fearful	.74	.04	.35
				Preoccupied	.58	.09	.34
				Dismissing	-.01	.98	.37
				Dismissing <sup>e</sup> (entered alone)	-.54	.002	.17
DV = Self-harm behaviour							
<u>Dimensions:</u> <sup>c</sup>	<i>B</i>	<i>p</i> value	<i>SE</i>	<u>Scales:</u> <sup>d</sup>	<i>B</i>	<i>p</i> value	<i>SE</i>
Anxious	.13	.09	.08	Secure	.50	.11	.37
Avoidant	-.08	.22	.07	Fearful	.55	.10	.33
				Preoccupied	.56	.09	.33
				Dismissing	.16	.66	.35
				Dismissing <sup>f</sup> (entered alone)	-.41	.01	.16

<sup>a</sup>  $\chi^2 = 16.57, p = .000$ , classified correctly = 63.2%.

<sup>b</sup>  $\chi^2 = 19.78, p = .001$ , classified correctly = 62.3%

<sup>c</sup>  $\chi^2 = 6.95, p = .03$ , classified correctly = 62.3%.

<sup>d</sup>  $\chi^2 = 10.95, p = .03$ , classified correctly = 66%.

<sup>e</sup>  $\chi^2 = 12.76, p = .000$ , classified correctly = 64.2%, when dismissing was entered alone into the analysis.

<sup>f</sup>  $\chi^2 = 7.61, p = .006$ , classified correctly = 66.0%, when dismissing was entered alone into the analysis.

**Table E2. Summary of logistic regression analyses for defense mechanisms predicting suicidal and self-harming behaviour**

Variables	<i>B</i>	<i>p</i> value	<i>SE</i>
DV = Suicide attempts <sup>a</sup>			
Denial defense	-1.97	.04	0.95
Projection defense	0.88	.13	0.59
Identification defense	2.18	.04	1.05
DV = Self-harm behaviour <sup>b</sup>			
Denial defense	-1.77	.06	0.95
Projection defense	0.20	.73	0.58
Identification defense	1.58	.13	1.04

<sup>a</sup>  $\chi^2 = 10.29, p = .02$ , classified correctly = 70.8%;

<sup>b</sup>  $\chi^2 = 5.19, p = .16$ , classified correctly = 63.2%;



## ENDNOTES

- <sup>1</sup> Results in this thesis are presented for the merged sample. Demographic characteristics and clinical presentation across the two time periods did not differ substantially. Interested readers are referred to Appendix B for details.
- <sup>2</sup> Data reported here do not include maltreatment by perpetrators other than primary parental attachment figures. Maltreatment rates, particularly for sexual abuse, would be expected to be higher if other perpetrators were included.
- <sup>3</sup> A score for anxious attachment was calculated by adding the two scales defined in terms of high anxiety (preoccupied and fearful) and subtracting the ratings of the scales defined by low anxiety (dismissing and secure); Avoidant attachment was calculated by adding the avoidant scales (fearful and dismissing) and subtracting the approach-oriented scales (preoccupied and secure).
- <sup>4</sup> The standard instructions are as follows: *“We’re going to make up some stories about some pictures. Just look at the picture, and tell me what’s happening. Tell me what led up to it, what’s happening now, and how it ends. Tell me what the people in the story are thinking and feeling.”* After the participant has completed each story, additional prompting was provided when the participant omitted one of the key elements of the story. In such cases a brief prompt such as *“what is the person feeling?”* was given. Additional clarification was requested by the examiner in response to any words or parts of the narrative they did not understand, to avoid misinterpretation of the data.
- <sup>5</sup> The validity of stories for coding was ensured by applying the following exclusionary criteria: 1) Stories of less than 20 words with insufficient prompting for further elaboration; 2) Stories in which youth refused, or were unable, to respond appropriately; 3) Stories in which technical problems interfered with complete transcription. Any stories, which met these exclusionary criteria, were dropped from further analyses on a case-by-case basis. The composite score for each defense was based on all remaining valid stories (i.e., cards). The final sample of 106 subjects included 23 subjects (22%) with one or more cards excluded from analyses. Of these 23 subjects, the majority were missing one or two cards (52%). The remainder were

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missing three or four cards. Principal components analyses presented in Appendix C, Table C-2, confirm that these missing cards did not have a substantial impact on the factor loading of these items on the composite scores for each defense.

- <sup>6</sup> Scores on each of the 10 cards were analyzed separately for each of the defense mechanisms. Analyses confirmed that 9 out of the 10 cards loaded onto a single factor for denial and projection; whereas all 10 cards loaded on a single factor for identification. One card was dropped from further analyses for denial and projection only. See Appendix C, Table C2.
- <sup>7</sup> Prior studies with a similar sample of youth have shown high inter-rater reliability for diagnostic classification, estimated by the kappa, for all disorders,  $\kappa = .90$  (CD), 1.0 (ODD), .83 (alcohol), 1.0 (marijuana), 1.0 (street drug), and .79 (major depressive) disorders (Moretti, Lessard, Wiebe, & Reebye, 2000).
- <sup>8</sup> As presented in Appendix C, a basic principal components analysis was used to confirm that the verbal and physical aggression items loaded on two separate factors. These findings are consistent with previous factor analytic studies of disruptive behaviour problems in children and adolescents (e.g., Burns & Patterson, 2000; Frick, Lahey, Loeber, et al., 1993; Storvoll, Wichstrom, Kolstad, & Pape, 2002).
- <sup>9</sup> The current results differ somewhat from previous findings in non-clinical samples in which males are more likely to use projection and females are more likely to use identification with denial used equally by both sexes (e.g., Cramer, 1987; 1991; 2002b; Hibbard & Porcerelli, 1998).
- <sup>10</sup> As expected, given the nature of many of the risk-taking behaviour examined in this study, a number of the dependent variable distributions were significantly positively skewed (See Table 4). Square root transformations were applied to the suicide frequency, self-harm frequency, physical aggression, and substance abuse scales. In addition, the suicide and self-harm scales were dichotomized into presence or absence of symptoms and examined using logistic regression analyses (presented in Appendix E). Overall, these analyses confirmed results obtained using the raw score frequency scales.

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- <sup>11</sup> The current study did not predict that defense mechanisms would moderate the relationships between attachment and risk-taking behaviour; however, these effects were examined as an alternative to the proposed mediator models. In keeping with the current theoretical hypotheses, the following moderators were examined in separate regression analyses: projection by insecure attachment predicting physical and verbal aggression; denial by avoidant attachment predicting alcohol and marijuana symptoms; and identification by anxious attachment in predicting suicide attempts and self-harm. In addition, based on the unexpected findings showing a negative relationship between denial and suicidal behaviour, the potential moderating role of denial on the relationship between anxious attachment and suicide attempts and self-harm was examined. In each case the defense mechanism variable was entered as a main effect into the first block of the regression with the attachment variables. The defense by attachment interactions were entered into the second block. None of the defense interactions were significant predictors of risk-taking behaviour.
- <sup>12</sup> A similar, but slightly stronger result was found using the factor score for physical aggression: fearful  $\beta = .38^*$ ; preoccupied  $\beta = .51^*$ ; dismissing  $\beta = .46^*$ ).