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## Suicidality as a Function of Impulsivity, Callous/Unemotional Traits, and Depressive Symptoms in Youth

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### Abstract

Suicidality represents one of the most important areas of risk for adolescents, with both internalizing (e.g., depression, anxiety) and externalizing/antisocial (e.g., substance use, conduct) disorders conferring risk for suicidal ideation and attempts (e.g., Bridge et al., 2006). However, no study has attended to gender differences in relationships between suicidality and different facets of psychopathic tendencies in youth. Further, very little research has focused on disentangling the multiple manifestations of suicide risk in the same study, including behaviors (suicide attempts with intent to die, self-injurious behavior) and general suicide risk marked by suicidal ideation/plans. To better understand these relationships, we recruited 184 adolescents from the community and those in treatment. As predicted, psychopathic traits and depressive symptoms in youth showed differential associations with components of suicidality. Specifically, impulsive traits uniquely contributed to suicide attempts and self-injurious behaviors, above the influence of depression. Indeed, once psychopathic tendencies were entered in the model, depressive symptoms only explained general suicide risk marked by ideation/plans but not behaviors. Further, callous/unemotional traits conferred protection from suicide attempts selectively in girls. These findings have important implications for developing integrative models that incorporate differential relationships between 1) depressed mood and 2) personality risk factors (i.e., impulsivity and callous-unemotional traits) for suicidality in youth.

### Keywords

Suicide risk; psychopathic tendencies; psychopathy; impulsivity; depression; callous/unemotional; gender; adolescence; youth; internalizing; externalizing

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Suicide is the third leading cause of death among youth in the United States (Anderson, 2002), with evidence suggesting that suicide rates are increasing both nationally (Bridge et al., 2006) and internationally (World Health Organization, 2002). The United States has among the highest rates of suicidality (World Health Organization, 2002), with an average of one in five youth reporting serious suicidal ideation or behavior (Grunbaum et al., 2002). Both genders demonstrate risk for suicide, with girls more likely to attempt suicide whereas boys are more likely to die from suicide (Bridge et al., 2006; Ross & Heath, 2002). Growing social and public health concern has led researchers to examine numerous correlates of youth suicide (Bridge et al., 2006; Evans et al., 2004; Gould et al., 2003), including those related to mood disorders and antisocial tendencies. Very few studies to date have examined links between suicide risk and psychopathic tendencies in youth, the latter construct

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gaining attention for its usefulness in deconstructing the heterogeneity of youth antisocial behavior (e.g., Frick, Bodin, & Barry, 2000; see Douglas, Herbozo, Poythress, Belfrage, & Edens, 2006). The present study is the first to attend to gender differences in the risk and protection conferred by psychopathic tendencies and depression in relation to three overlapping, but distinct, measures of suicidality – general risk marked by ideation/plans, self-injury, and suicide attempts.

## Mental Health Correlates of Youth Suicide

Numerous correlates of youth suicide have been identified, including personality (e.g., impulsivity), biology (e.g., serotonin functioning, pubertal development), psychopathology (e.g., mood, substance disorders), demographics (e.g., sexual orientation, gender, age), social adversity (e.g., abuse, stressful life events), and socio-cultural factors (e.g., imitation, contagion, media) (see Bridge et al., 2006; Evans et al., 2004; Gould et al., 2003 for reviews). Among these correlates, mood disorders include the most oft studied. In fact, a diagnosis of Major Depressive Disorder (MDD), and depressive symptoms more broadly, has been identified as the strongest and/or most prevalent risk factor for suicidality (Gould et al., 2003; Kandel, Raveis, & Davies, 1991; Marttunen, Aro, Henriksson, & Lonnqvist, 1991). Researchers have advanced etiological mechanisms to explain the role of depression, including that depression is one part of a more pervasive affective state that includes feelings of worthlessness (Wichstrom, 2000), hopelessness (Beck, Steer, Kovacs, & Garrison, 1985), and neuroticism (Beautrais, Joyce, & Moulder, 1999).

Other studies have implicated the role of antisocial or externalizing-spectrum psychopathology and personality factors. This includes links between suicidality and aggression (Brent et al., 1994; Brent & Mann, 2005; Pfeffer, Plutchik, & Mizrucki, 1983), impulsivity (Apter, Plutchik, & van Praag, 1993), antisocial behavior (Marttunen et al., 1991), substance use (Brent, Baugher, Bridge, Tuhao, & Chiappetta, 1999; Wuderlick, Bronisch, & Wittchen, 1998), and conduct or disruptive disorders (Andrews & Lewinsohn, 1994; Sourander et al., 2001). Researchers have advanced that suicidal behaviors in particular constitute the “externalization” of emotions (Tyler, Whitbeck, Hoyt, & Johnson, 2003) and are important indicators of poor self-control or problem solving, a cognitive deficit linked to engaging in suicidal behaviors (Gould et al., 2003). Further, the presence of externalizing psychopathology – and impulsivity in particular – is thought to underlie the intergenerational transmission of suicide attempts (Brent, Bridge, Johnson & Connolly, 1996; Brent et al., 2002; Brent & Mann, 2005, Mann, 1998).

Research has consistently documented high rates of comorbidity among depression and externalizing tendencies (Bridge et al., 2006; Shaffer et al., 1996; Wunderlich et al., 1998), making it difficult to document their unique roles when it comes to suicide risk. In previous work, the following factors continued to make unique contributions to the prediction of suicidality, even after accounting for the influence of depression: externalizing tendencies (Lewinsohn, Rohde, & Seeley, 1996), conduct problems (Kandel et al., 1991; Sourander et al., 2001), engagement in illegal activity (Tyler et al., 2003), and impulsivity (Kashden, Fremouw, Callahan, & Franzen, 1993). These findings mirror those from the adult literature, which suggest that externalizing psychopathology uniquely contributes to suicide attempts (Hills et al., 2009) even after accounting for shared variance with internalizing psychopathology and the comorbidity between internalizing and externalizing psychopathology (Verona, Sachs-Ericsson, & Joiner, 2004). Importantly, early work by Apter and colleagues conducted with youth (Apter et al., 1993; Apter et al., 1995) stipulated that impulsivity-related disorders (like conduct problems) may serve as risk factors for suicide, regardless of the presence of depression. The present study is one of the first to investigate the differential contributions of depression and antisocial-psychopathic

tendencies in youth in order to disentangle the heterogeneity of suicide risk and protection. Psychopathic traits have been examined in relation to suicidality in adults but have gone relatively unstudied in youth (see Douglas et al., 2006, for an exception).

## Psychopathic Tendencies and Youth Suicidality

Psychopathic tendencies share some features with externalizing behaviors and provide a unique opportunity to disentangle the heterogeneity inherent in the broad ‘externalizing’ spectrum. Psychopathy is often conceptualized as multidimensional, with distinct facets representing affective (emotional detachment, lower capacity for intimacy, immunity to guilt or shame), interpersonal (arrogant, dominant, deceitful) and behavioral (e.g., antisocial, impulsive, aggressive) dimensions (e.g., Cooke & Michie, 2001). Quite extensively studied in adult populations, evidence has also been mounting for the downward translation of psychopathic tendencies in adolescent populations (e.g., Lynam et al., 2005; Salekin et al., 2005), suggesting that these facets are important for accounting for extreme manifestations of aggression and deviance in youth. A substantial portion of the literature on youth psychopathic tendencies is based on research with the Antisocial Process Screening Device (APSD; Frick & Hare, 2001). This instrument has proven reliable and valid, yielding a three-factor model similar to adult psychopathy: callous-unemotional (affective), narcissism (interpersonal), and impulsivity (behavioral) dimensions (Frick et al., 2000; Vitacco, Rogers, & Neumann, 2003). In support of its construct validity, research indicates the APSD is useful for assessing and predicting violence and conduct problems in youth (Frick et al., 2000) and evidences similar personality correlates as adult psychopathy (Sadeh, Verona, Javdani, & Olson, 2009).

Though Cleckley’s (1976) monograph on psychopathy suggested that individuals with high levels of psychopathic traits rarely engage in suicide, aggressive and antisocial individuals are at heightened risk for suicidality (Bukstein et al., 1993, Goldston et al., 1998). Previous research with adults suggests that this paradox can be reconciled by examining distinct facets of psychopathy. For instance, suicidality was positively linked with the impulsive-antisocial facet, but was unrelated to the affective and interpersonal facet of psychopathy in adult male offenders (Verona, Patrick, & Joiner, 2001). In addition, low levels of trait constraint (or impulsivity) account for the relationship between suicidality and the impulsive-antisocial facet of psychopathy in male adult and youth offenders (Douglas et al., 2008; Verona et al., 2001). Further, the impulsive-antisocial facet accords risk for both suicide attempt and non-suicidal self-injury in male and female adult psychiatric patients (Swogger, Conner, Meldrun, & Caine, 2009). Research has also investigated the affective-interpersonal traits of psychopathy, with two studies finding a negative link to ideation in male offenders (Douglas et al., 2008) and attempts in female offenders (Verona, Hicks, & Patrick, 2005). Other studies have found no association (Swogger et al., 2009; Verona et al., 2001; see also Douglas et al., 2006).

Thus, although a link between suicidality and the impulsive-antisocial facet has been consistently found (Douglas et al., 2006; Douglas et al., 2008; Swogger et al., 2009; Verona et al., 2001), findings regarding the interpersonal and affective facets of psychopathy are more equivocal. Mixed findings serve to underscore the importance of further investigating psychopathy-suicide relationships, with attention to whether and to what extent these relationships can be translated downward to both male and female youth. Indeed, no study to date has examined gender differences in the association between suicide and psychopathy, and there has been a paucity of research on youth in particular. Examining different facets of psychopathy and suicide risk indicators can begin to reconcile equivocal findings and reveal different pathways of risk for youth who have similar clinical manifestations (i.e.,

engagement in antisocial behaviors), where some psychopathy facets confer risk while others confer protection.

## Different Suicide Risk Indicators

Suicidal ideation, self-injury, and attempts are key risk factors for suicide completions (Brent et al., 1999; Shaffer et al., 1996), making each important for understanding death by suicide in youth. The majority of research to date has not distinguished between components of suicide risk when examining mental health correlates (see Bridge et al., 2006 for a review). Some evidence suggests that these thoughts/behaviors may be associated with both overlapping and distinct etiologies (Gould et al., 2003; Gould et al., 1998; Linehan, Chiles, Egan, Devine, & Laffaw, 1986; Wichstrom, 2009). For example, a growing body of work on non-suicidal self-injury, or the deliberate destruction of body tissue without explicit intent to die, suggests self-injury is related to, but distinct from, ideation /attempts (Hooley, 2008; Nock, 2009).

Only a few studies have uncovered specific risk factors for ideation, self-injury, and attempts, with one making this distinction in relation to psychopathy in particular (Swogger et al., 1999). For instance, although both suicidal ideation and attempts ‘run in families’, research suggests that Axis I psychopathology predominantly confers risk for the generational transmission of ideation, while aggressive and impulsive tendencies facilitate the transmission of suicide attempts in particular (Brent, Bridge, Johnson, & Connolly, 1996). Another study found that impulsivity was the primary factor that distinguished between suicide attempters and psychiatric and community controls, even after covarying internalizing tendencies (Kingsbury et al., 1999). Further, suicide attempts reported in the absence of ideation seem to be primarily fueled by impulsivity (Lewinsohn, Rohde, & Seeley, 1996). This latter finding is consistent with theorizing that depression may fuel ideation, but engaging in suicide-related behaviors involves low impulse control (Bridge et al., 2006; Linehan, 1993), sometimes even without the presence of depression or ideation (Apter et al., 1993; 1995).

Fewer studies have been conducted examining unique risk factors for non-suicidal self injury, with most reporting general associations between self injury and both internalizing and externalizing psychopathology (Jacobsen & Gould, 2007; Nock et al., 2006), including the impulsive-antisocial traits of psychopathy (Swogger, et al., 2009). This relatively small literature suggests that depression may confer risk more broadly for suicide ideation/plans, whereas antisocial/impulsive tendencies may confer risk specifically for behavioral manifestations of suicidality (particularly attempts), with less research conducted on predictors of self-injury.

## Gender and Suicide Risk

The most consistently investigated gender effects have been in regards to the prevalence of suicide outcomes (e.g., Bridge, et al., 2006), with some studies indicating that girls are at greater risk of ideation and engagement in non-suicidal self injury or suicide attempts, whereas boys are at greater risk of suicide completion (e.g., Bridge et al., 2006; Ross & Heath, 2002). More rarely, data have also informed gender-specific mental health correlates, but this research has advanced mostly equivocal findings. For instance, a number of studies have linked mood disorders to suicide risk in girls, and conduct problems and substance use as important for boys (e.g., Gould et al., 2003). In contrast, other research concluded that externalizing behaviors (e.g., aggression) in girls and dependent traits (e.g., helplessness) in boys confer the most risk (Gould et al., 2003; Reinherz et al., 1995).

Our study was built partly on a conceptualization highlighting the role of the affective-interpersonal traits in female manifestations of psychopathic tendencies. At a theoretical level, callous/unemotional are more gender-incongruent for women than men, because they deviate from traditional gender roles that prioritize emotional responding and empathy in girls (e.g., Keenan & Shaw, 1997; Verona & Vitale, 2005). As such, they may represent hallmark features of deviance in girls. Indeed, the affective-interpersonal facets of psychopathy (e.g., superficial charm, conning) are rated by juvenile justice staff as more prototypical of psychopathic girls, whereas the antisocial deviance features (e.g., aggressive criminal behavior) are rated as more prototypical for boys (Cruise, Colwell, Lyons, & Baker, 2003; Salekin, Rogers, & Machin, 2001). In contrast, engagement in suicide-related behaviors (particularly self-injury and attempts) are considered female gender-congruent, as suicide attempts and self-injury are common among girls who display emotional regulation problems (Linehan, 1993; Miller, Rathus, & Linehan, 2006). Girls who display callous/unemotional traits, therefore, may be more immune to socialization factors and be better protected against gendered outcomes, such as suicide attempts or self-injury. Consistent with this hypothesis, there is some evidence that the presence of affective-interpersonal traits is protective of female-relevant symptomatology, including anxiety (Verona et al., 2001) and somatization (Lilienfeld & Hess, 2001). Thus, affective-interpersonal deficits can accord protection to particular mental health outcomes, like suicidality, and to a greater degree in women than men (e.g., Verona et al., 2005). In the present study, we directly investigated the possibility that affective-interpersonal traits would play a protective role for suicidal behaviors more so for girls versus boys, given that they signal girls' greater immunity to socialization forces that encourage empathy and emotionality. This work can also better inform some of the equivocal findings from the adult literature regarding affective-interpersonal links to suicide risk indicators.

## Present Study

Our primary goal was to investigate the potentially distinct contributions of antisocial tendencies, expanded to include psychopathic traits, and depressive symptoms in relation to suicide risk across adolescents of both genders. Specifically, we 1) deconstructed the heterogeneity of antisocial tendencies by examining whether the three dimensions of psychopathic traits conferred different levels of risk for suicidality; 2) examined whether depression and psychopathic tendencies are differentially associated with distinct measures of suicidality, and 3) expanded on the scarcity of work examining gender-specific risk by analyzing gender differences. In so doing, we aimed to expand the knowledge base around variables explaining distinct suicide outcomes, with specific attention to a) an overall measure of suicide risk characterized primarily by ideation, plans, and threats, b) self-injurious behaviors of all kinds, and c) suicide attempts where youth reported an intent to die (see Evans et al., 2004, and O'Carroll, 1996, for similar conceptualization of suicide).

We hypothesized that psychopathic tendencies related to impulsivity would confer risk for suicidality, whereas the affective and interpersonal deficits of psychopathy would be unrelated to or confer protection for suicidality (e.g., Douglas et al., 2008; Verona et al., 2001, 2005). In addition, while depression would be significantly related to general suicide risk marked by ideation/plans, only impulsivity would relate to the *behavioral* indicators of suicide risk, namely self-injury and suicide attempts. This hypothesis was based on previous work documenting the potent risk conferred by impulsivity-related problems even in the absence of depressive symptomatology (Apter et al., 1993; Apter et al., 1995). Finally, we expected that the affective-interpersonal deficits (i.e., callous/unemotional traits) would be particularly protective of youth suicidality more so in girls than boys (Verona et al., 2005).



## Method

### Participants

Participants included 184 youth ranging in age from 11 to 17 (see Table 1 for demographic and descriptive information). We engaged in a targeted recruitment strategy to ensure a diverse sample of youth with a range of suicide risk as well as antisocial tendencies. As such, our final sample consisted of two subsamples: (1) a treatment-seeking sample composed of youth receiving services from human service and juvenile justice agencies either at the time of recruitment or in the past ( $n = 99$ ), and (2) a community sample composed of youth without a treatment history ( $n = 85$ ). Youth were primarily recruited through newspaper and email advertisements (58%), as well as referred from treatment centers (17%), community fliers (8%), schools (7%), and friends or other/misc. sources (10%).

The overall sample consisted of 100 girls (54.3%) and 84 boys (45.7%). Table 1 reports the demographic characteristics of the overall sample and boys and girls separately. The parents identified 115 youth as European-American (62.8%), 34 as African-American (18.6%), 10 as Hispanic (5.5%), 5 as Asian (2.7%), and 19 as biracial (10.3%). Participants were characterized by a diverse range of income levels reflecting annual median incomes for the geographic region (U.S. Census Bureau): \$1-\$30,000 ( $n=60$ , 33.1%), \$30,001-\$60,000 ( $n=48$ , 26.6%), and \$60,001-\$75,000+ ( $n=73$ , 40.3%), with a median household size of 2.6 people. Boys and girls did not differ on any demographic variable, including recruitment, age, ethnicity, or income.

### Procedures

A telephone screening process was used to assess eligibility and exclude youth with a history of psychotic symptoms or a pervasive developmental disorder (less than 2% of the potential participants). Youth and parents were informed that the goal of the study was to better understand important aspects of adolescent development, including their feelings, thoughts and behaviors. If youth were eligible, an appointment was scheduled for a parent or guardian and the adolescent. During this appointment, parents provided informed consent and youth provided assent, and they both completed interviews and questionnaires assessing psychopathic tendencies, depression, suicidality, and demographic information. Youth and parents were interviewed and completed questionnaires separately in order to enhance their comfort and encourage honest responding. Due to our direct assessment of suicide ideation and behaviors, a screening and extended suicide assessment protocol was in place to ensure the safety of participants (including engagement in safety contracting and referral to appropriate resources).

### Depressive Symptoms

Youth and a parent or guardian were administered the Kiddie Schedule for Affective Disorders and Schizophrenia – Present and Lifetime Version (K-SADS-PL; Kaufman, Birmaher, Brent, Rao, & Ryan, 1996), a semi-structured diagnostic interview based on criteria from Diagnostic and Statistical Manual (DSM-IV-TR), to assess youth symptoms of Major Depressive Disorder (MDD). One of the most widely used clinician-rated instruments for youth, the K-SADS-PL has demonstrated adequate validity and test-retest reliability when used with both treatment and non-treatment samples (Ambrosini, 2000; Kaufman et al., 1997). Following K-SADS guidelines, parents and youth answered diagnostic questions separately during private interviews, and trained clinicians rated all individual symptoms based on information and observations provided by both parents and during interviews. Each symptom of MDD was rated as to its presence on a scale of 1 to 3 (1 = no present; 2 = subthreshold; 3 = threshold), and an index of lifetime symptom counts was obtained by

summing the symptoms met at threshold level for past and current symptoms. Secondary ratings for each symptom were completed by trained independent raters for 37% of participants, and intra-class correlations demonstrated high levels of agreement between independent raters (ICC for lifetime symptom counts of MDD = .89).

For the purpose of analyses, a sum of lifetime threshold symptom counts of MDD was calculated and normalized with a BLOM transformation to reduce skewness. Use of continuous indicators to assess psychopathology (Krueger & Finger, 2001), including symptom counts of DSM-IV disorders, have been shown to be valid indicators of youth psychopathology in previous research (e.g., Yager, Bird, Staghezza-Jaramillo & Gould, 1993) and excellent predictors of school and community functioning (Stoep, Weiss, McKnight, Beresfor, Cohen, 2002). To prevent criterion overlap between psychopathology and suicide variables, suicide criteria were not included in our calculation of MDD symptom counts.

### Antisocial and Psychopathic Traits

The 20-item Antisocial Process Screening Device (APSD; Frick & Hare, 2001) was designed to assess psychopathic tendencies in youth. The APSD was developed as a downward translation of the adult Psychopathy Checklist – Revised (Hare, 1991), a widely used and well-validated measure of adult psychopathy. Items on the APSD were modified to make them developmentally appropriate for use with children and adolescents and capture the affective, interpersonal, and behavioral dimensions of psychopathy identified in the adult literature, which research suggests it does (Vitacco et al., 2003). The APSD contains items scored on a 3-point scale (0 = “not at all true”, 1 = “sometimes true”, 2 = “definitely true”) that form three subscales: Callous/Unemotional (6 items), Impulsivity (5 items), and Narcissism (7 items), representing the affective (“Does not show feelings or emotions”), behavioral (“Acts without thinking of the consequences”), and interpersonal (“Seems to think he/ she is better or more important than other people”) characteristics of psychopathic tendencies, respectively (Frick et al., 2000). In this study, we used the youth-reported rather than parent-reported scores on the APSD, as recommended (Frick, Barry, & Bodin, 2000) and consistent with previous research conducted with mid- to older-adolescent samples (e.g., Kruh, Frick, & Clements, 2005; Salekin et al., 2005). The parent and youth reports were moderately correlated<sup>1</sup>, but we opted for the self-reported APSD given that our sample consisted primarily of mid to older adolescents (Mean age = 14 years). The youth self-report version provided a better measure of behaviors and affective experience to which parents and teachers are less privy as observers and has demonstrated moderate levels of stability over time (1-2 years, e.g., Munoz & Frick, 2007). The internal consistency of the total measure was good (alpha = .74), and the moderate internal consistencies of each subscale – Callous/Unemotional (alpha = .56), Impulsivity (alpha = .53) and Narcissism (alpha = .66) – characterize values typical for these self-report indices in other studies (Poythress, Dembo, Wareham, & Greenbaum, 2006). Despite these lower internal consistencies, empirical work has supported the three factor model for the youth version of the APSD (Vitacco et al., 2003). Additionally, evidence suggests adequate criterion-related validity, particularly for the association of Callous/Unemotional traits with disturbances in affect-related experiences and Impulsivity with tendencies for behavioral dyscontrol (e.g., Loney, Frick, Clements,

<sup>1</sup>Parent- and youth-reported subscales of the APSD were correlated as follows: Total:  $r = .41, p < .001$ , Impulsivity:  $r = .37, p < .001$ , C/ U:  $r = .26, p < .001$ , Narcissism:  $r = .31, p < .001$  and are similar to those found in other research (Total  $r = .54$ ; Kimonis et al., 2006; Total  $r_s = .47 - .57$  across three time points; Munoz & Frick, 2007). Analyses conducted separately with the parent-reported APSD suggest parallel results for suicide ideation, where only MDD is a significant predictor ( $B = .31, p < .001$ ). In contrast, results for self-injury and attempts are discrepant, such that impulsivity does not explain self injury (Wald = 2.44,  $p = .12$ ) or attempts (Wald = .05,  $p = .82$ ) above the influence of depression. Also, no gender x CU interaction emerges in relation to suicide attempt (Wald = .01,  $p = .93$ ).

Ellis, & Kerlin, 2003; Vitacco et al., 2003; see also Sadeh et al., 2009). Multiple studies from different research groups have used the self-report APSD (Kruh, Frick, & Clements, 2005; Salekin et al., 2005) and report good validity in adolescent samples (e.g., Vitale et al., 2005).

### Suicidality Measures

Youth completed the Suicide Behavior Questionnaire-Revised (SBQ-R; Osman, Bagge, Gutierrez, Konick, Konner, & Barrios, 2001), a 4-item measure in which youth reported on suicidal thoughts in the last year (e.g., “how often have you thought about killing yourself in the last year”), lifetime suicidal verbal threats (e.g., “have you ever told someone that you were going to commit suicide, or that you might do it?”), and suicide ideation/planning (e.g., “have you ever thought about or attempted to kill yourself”). These are scored on a five point Likert scale from lowest (1) to highest (5) frequency. The SBQ-R is a good indicator of broad suicide risk primarily emphasizing suicidal thoughts, threats and plans (although one item does include engagement in attempt if endorsed at level 4 or 5). It has been well validated for use with an adolescent population and demonstrates adequate reliability (Osman et al, 2001). As recommended in the literature on this measure, a total suicide risk score was computed as the composite of all 4 items, which demonstrated good internal consistency in this sample (Cronbach’s alpha = .73). The SBQ-R represents a broad measure of suicide risk characterized primarily by ideation, plans, and threats.

To obtain specific assessments of suicidal behaviors, youth were administered a short interview adapted from Linehan and Comtois’ (1997) Lifetime Parasuicide Count (LPC). This interview asks about several methods used by the adolescent to hurt her/himself (e.g., stabbing, hanging, burning), as well as the level of intent (to die) during the act (“definitely”, “mostly”, “somewhat”, “only a little”, “no” intent). The interview has been shown to be a good predictor of future suicide attempts in adolescents (Goldston et al., 1998), and was developed for use in clinical settings in which distinctions regarding level of intent to die are of primary importance; thus, this measure is designed to be sensitive to distinguishing between our primary suicide-related behaviors of interest (Linehan & Comtois, 1997). Responses to this interview were coded by the researchers to create two dichotomous composite variables (0 = *no*, 1 = *yes*). The first variable informs lifetime *self-injurious behavior* where a 1 on this variable indicates that youth had engaged in any self-injurious behavior in their lifetime, regardless of intent. A second indicator was more specific and assessed lifetime *suicide attempts* where youth reported engagement in self-injurious behavior where they also reported *any* intent to die during commission of this act (O’Carroll, 1996). The self-injury and suicide attempt variables were markers of suicidal *behaviors* specifically, with suicide attempt being the most severe suicidality indicator. Secondary ratings for each behavior were completed by one trained independent rater who listened to 15% of the audiotaped suicide interviews. Primary and secondary raters showed 100% concordance (i.e., because these are dichotomous outcomes, secondary ratings indicate that youth rated by primary interviewers as engaging in self-injury and suicide attempt were also rated as engaging in these behaviors by a secondary rater).

The self injury and suicide attempt indicators do not necessarily imply two mutually exclusive groups of youth. That is, the same youth may have been counted in both of these categories if they engaged in one suicide attempt (with intent to die) and another self-injurious behavior (without intent to die). In our sample, 34 youth engaged in any self-injury, regardless of intent, and they constitute the “yes” on the *self-injury* variable (of those youth, 13 reported never having an intent to die). Twenty-one youth reported intent to die at least once and constitute the “yes” on the *suicide attempt* variable. Almost half of youth reported engaging in self-injury and suicide in the past year (40% and 45%, respectively), while most of the remainder reported first engaging in these acts within the last 2-3 years



(45% and 25%, respectively). Importantly, these data do not capture the last time youth participated in self-injury or attempt, only their first engagement in these behaviors. Follow up analyses show that relationships between the APSD and our suicide indicators were similar for recent (last year) versus past injury and attempt.

### Data Analytic Strategy

Although the treatment-seeking and community subsamples differed on measures of psychopathology, initial analyses indicated that recruitment sample (treatment-seeking versus community) did not interact with any of our explanatory variables (depression and APSD facets) to account for the suicidality indicators. Thus, sample type was not included in subsequent analyses. To examine the contribution of depression and psychopathic tendencies to the postdiction of the three suicidality measures, we conducted 4-step regressions hierarchically, with the first block including age, family income, and gender, the second block including MDD symptom counts, the third block comprising the 3 APSD facets, and the fourth block including gender interactions with each APSD facet.

For linear regressions (explaining general suicide risk using total scores on SBQ-R), beta coefficients and changes in variance accounted for ( $\Delta R^2$ ) are reported. For logistic regressions (explaining self-injurious behavior and suicide attempts), the Wald statistic,  $-2$  Log Likelihood, and odds ratios are reported. The Wald statistic is an indicator of the explanatory variable's independent contribution after holding other explanatory variables constant and is calculated as the ratio of the beta coefficient divided by the standard error for that individual explanatory variable (Tabachnick & Fidell, 2001). The Wald statistic is considered appropriate to use even when the probability of obtaining a score of 0 is high (e.g., when most participants do *not* endorse an outcome) (e.g., Afifi, Kotlerman, Ettner & Cowan, 2006), which is the case in our data. The  $-2$  log likelihood ( $-2LL$ ) is an indicator of model fit, whereby significant decreases from previous blocks represent improvements in variance explained by the model. Odds ratios represent measures of effect size and provide the likelihood or odds of an outcome (e.g., self-injury "yes" vs. "no") given the participant's level on the independent variable (e.g., gender). An odds ratio of 1 would indicate that the probability of the outcome "yes", for example, is similar across levels of the independent variable (e.g., males and females). Significantly lower odds would be associated with protection and significantly higher odds would be associated with risk.

## Results

### Means and Inter-correlations

Descriptive and demographic statistics for the APSD and measures of suicidality and self-harm are reported in Table 1 for the total sample as well as for girls and boys separately. Importantly, the means and range of scores endorsed on the APSD are comparable to those found in other studies, with the treatment-seeking sample having a similar range as youth recruited from detention centers (e.g., Murrie & Cornell, 2002). Treatment-seeking and community youth differed in expected ways, including that treatment-seeking youth were more likely to endorse symptoms of MDD,  $t(176) = -5.27, p < .01$ , and scored higher on the APSD,  $t(176) = -2.84, p < .01$ . Girls and boys were also compared across study variables and evidenced a few expected differences. Specifically, girls were characterized by a greater number of MDD symptoms,  $t(176) = 19.24, p < .01$ , and reported significantly more suicide risk marked by suicide ideation and threats, as measured by the SBQ-R,  $t(181) = 2.00, p < .05$ . However, girls and boys did not differ on history of self-injurious behavior or suicide attempts (see Table 1). Boys scored significantly higher on total APSD,  $F(176) = 3.80, p < .05$ , an effect driven by the APSD Impulsivity facet in particular,  $F(176) = 3.80, p < .05$ .

Intercorrelations among the APSD subscales for the total sample ranged from .22 to .56, with a moderate association between Callous/Unemotional and Narcissism ( $r = .25, p < .01$ ), and a higher association between Narcissism and Impulsivity ( $r = .55, p < .001$ ). Across the whole sample, MDD was positively related to general suicide risk marked by ideation/threats ( $r = .44, p < .01$ ), self-injurious behavior ( $r = .29, p < .01$ ), and suicide attempts ( $r = .25, p < .01$ ). Further, the Impulsivity facet of the APSD was significantly associated with all indicators of suicidality, including suicidal ideation and threats, self-injurious behaviors, and suicide attempts with intent to die (range in  $r$ s = .18 to .25), while Narcissism and Callous/Unemotional traits were not significantly related to any of the suicidality indicators. Within-gender bivariate correlations between each facet of the APSD and suicidality are reported in Table 2. These indicated that similar associations characterize girls and boys, although some of the APSD relationships to suicidality measures were only marginally significant in the boys.

### Depression, Psychopathic Tendencies, and Suicidal Ideation/ Threats

Next, we conducted a series of linear and logistic regressions to examine unique associations between MDD symptom counts, psychopathic tendencies and suicidality indicators (see Table 3).<sup>2,3</sup> For our first model, a linear regression was conducted with the SBQ-R, our indicator of broad suicide risk marked by ideation and threats. Age ( $\beta = .23, p < .01$ ) and income level ( $\beta = -.19, p < .05$ ) in the first block and MDD symptom counts ( $\beta = .38, p < .001$ ) in the second block were significantly related to the SBQ-R. That is, older youth, those with lower income, and those with more depressive symptoms reported more suicide risk on the SBQ-R. When the APSD Callous/Unemotional, Narcissism, and Impulsivity scales were entered simultaneously in the third block, none of these facets of psychopathic tendencies explained a significant amount of variance in SBQ-R ( $\Delta R^2 = .02$ ), while MDD symptom counts remained a significant explanatory variable ( $\beta = .35, p < .001$ ). In the final block, the interactions between gender and each APSD facet were entered, and no significant interactions emerged. Thus, results suggest that MDD symptoms are significant contributors to suicide risk marked by ideation, plans and threats while psychopathic tendencies, as indexed by facets of the APSD, did not explain a significant amount of variance above that explained by MDD symptoms and demographics. Indeed, when we conducted another regression including the same demographic variables but entering MDD symptom counts *after* the APSD variables, we found that MDD symptoms explained about 11% of the variance in the SBQ-R above that contributed by the APSD factors ( $\Delta R^2 = .11, p < .001$ ).

### Depression, Psychopathic Tendencies, and Suicidal Behavior

We next conducted logistic regression analyses postdicting self-injurious behavior, and the results are reported in the second column of Table 3. Modeling followed the same sequence as above, and results indicated that MDD symptom counts were positively associated with self-injurious behavior when entered only in the context of demographic variables (Wald = 5.56,  $p < .05$ , OR = 1.60). In contrast to results of regressions with the SBQ-R, MDD symptom counts were no longer significantly related to self-injurious behavior once the APSD facets were included in the third block of the model (Wald = 1.69,  $p = .19$ , OR = 1.32). Instead, APSD Impulsivity emerged as a significant explanatory variable (Wald = 9.05,  $p < .01$ , OR = 2.67), and the inclusion of the APSD variables produced an increment in fit as suggested by a significant drop in  $-2LL$  between the second and third blocks (see

<sup>2</sup>Age was significantly positively related to all suicide outcomes. This finding replicates multiple other studies (see Bridge et al., 2006 for a review), with current theories suggesting this results is explained by hormonal factors (i.e., puberty), greater opportunity to engage in these behaviors (i.e., because they are older), and lower levels of monitoring (Bridge et al., 2006).

<sup>3</sup>Separate analyses were conducted to examine whether any interactions between the APSD factors themselves (e.g., Impulsivity x Callous-Unemotional) were associated with the three suicidality indicators, but no significant two or three way interactions emerged.

Table 3). No significant Gender x APSD facet interactions were found in the final block of modeling. Thus, results suggest that Impulsivity explains a significant amount of variance in self-injurious behavior above that accounted for by MDD symptom counts.

The final logistic regression analysis examined suicide attempts with intent to die, reported in the third column of Table 3. Results indicated that MDD symptom counts were positively related to suicide attempts when entered in the second block (Wald = 5.58,  $p < .05$ , OR = 1.78) but were no longer related once the APSD facets were entered in the third block (Wald = 1.53,  $p = .22$ , OR = 1.38). Instead, APSD Impulsivity was significantly associated with suicide attempts (Wald = 9.24,  $p < .01$ , OR = 4.08). The model fit improved once APSD facets were entered as explanatory variables, as indexed by a significant drop in the  $-2LL$ . Finally, in the last block, a significant Gender x Callous/Unemotional interaction emerged (Wald = 3.98,  $p < .05$ , OR = 2.20). This significant Gender x Callous/Unemotional interaction was disentangled by conducting logistic regressions for each gender separately. For girls, Callous/Unemotional traits were negatively linked with suicide attempts (Wald = 6.25,  $p < .05$ , OR = .24), suggesting that they serve a protective role in relation to suicide attempts for girls. For boys, callous/unemotional traits were not significantly related to suicide attempts (Wald = .16,  $p = .69$ , OR = 1.26).

## Discussion

This study is the first to examine the differential associations between depressive symptoms, psychopathic tendencies, and markers of suicidality in youth. Consistent with previous research, we demonstrated that the impulsivity facet of psychopathic tendencies conferred risk for self-injurious behaviors and attempts across genders. Novel to our study was the finding that the callous/unemotional facet conferred protection from suicide attempts in girls specifically, a finding warranting further replication<sup>4</sup>. These findings help to disentangle the heterogeneity of antisocial/externalizing propensities and their associations with suicide risk, such that some tendencies are risk factors for and some are protective of suicidality – even though they are both associated with antisocial behavior. Findings also replicate and extend research conducted in adults, adding to the construct validity of youth psychopathic tendencies. Importantly, relationships between psychopathic traits and suicidal behaviors were found above the influence of depressive symptomatology, which was positively linked to general suicide risk marked by ideation, plans, and threats (cf., Bridge et al., 2006). Divergent findings underscore the heterogeneous nature of risk for adolescent suicidality, in terms of (a) psychopathic facets and depression, (b) suicide risk indicators, and (c) gender.

### Depression, Impulsivity, and Suicide Risk

These data have implications for future research geared towards clarifying different models of suicide risk in youth. One model that can be gleaned from the present findings is that depression confers the most potent risk for suicidal ideation, threats, or plans but is not the primary driver of suicidal behaviors. Instead, impulsive tendencies may ultimately determine youth engagement in self-injury or attempt. This analysis parallels conceptualizations proposed in models of youth suicidality (Apter et al., 1995; Brent & Mann, 2005; Bridge et al., 2006), which suggest that impulsive/aggressive tendencies heighten risk for engagement in suicide behaviors even without the presence of ideation or depression<sup>5</sup>. Thus, both sets of potentially overlapping vulnerabilities for youth suicidality may be important – those that arise from mood states and those that arise from impulsive traits (e.g., Brent & Mann, 2005); however, they each affect suicide risk at different levels

<sup>4</sup>Previous theory suggests that depressive states interact with impulsive dispositions to lead to suicidal behaviors (e.g., Bridge et al., 2006). We examined this by testing whether MDD interacted with the APSD to confer risk for suicide behaviors and found no significant MDD by APSD IMP interactions for self-injury (Wald = .01,  $p = .91$ ) or attempts (Wald = .59,  $p = .44$ ).

(ideation/planning vs. behaviors). Interestingly, the former has been conceptualized as being primarily motivated by “a wish to die”, while the latter is motivated by “a wish to not be here for a time” (Apter et al., 1995).

A second related model draws from work on the neuropsychology of depression, which has demonstrated that depressive states reduce prefrontal cortex activation generally and the left dorsolateral prefrontal cortex in particular, where executive functions are governed (Herrington et al., in press; Heller & Nitschke, 1997). Indeed, depression is associated with various executive cognitive deficits, including problems with memory, attention, and problem-solving (Rogers et al., 2004; Levin, Heller, Mohanty, Herrington, & Miller, 2007). In this model, depression may exacerbate already deficient regulatory processes, suggesting that depression may itself give rise to impulsive behaviors. This may be particularly relevant to our findings, given that we examined suicidality in adolescence, a period when the prefrontal cortex is still in development and executive functions governing behavior regulation are not fully formed (Blakemore & Choudhury, 2006). Interestingly, callous-unemotional traits are often negatively related to negative affective states (e.g., Sadeh et al., 2009); thus, youth high on these traits would be less likely to suffer from depression and therefore less likely to experience deficient executive functions (Sellbom & Verona, 2007), which in turn would protect them from suicidal behaviors. The latter is what we found in the girls in our sample. In essence, depression need not be conceptualized as completely distinct from impulsive and antisocial traits. On the contrary, depression may be particularly important for explaining self-injury and suicide attempts to the extent that it works to reduce capacity for behavioral regulation, consistent with the role that negative affect plays in exacerbating impulsivity (Cooper, Agocha & Sheldon, 2000) and self-defeating behavior (Baumeister & Scher, 1988).

Finally, an alternative model suggests that personality dimensions related to disinhibition drive the risk for both depression and impulsivity, in that these syndromes both involve difficulties in regulating behavior. Specifically, depressive mood states involve overregulation of appetitive behaviors (e.g., anhedonia) and impulsivity involves underregulation of approach behaviors (e.g., risk-taking; Carver, Johnson, & Joormann, 2008). This conceptualization may suggest that a general predisposition toward low self-regulation that fosters depressed mood and impulsivity or aggression is the primary mechanism by which youth suicide occurs. Indeed, regulatory systems involving serotonin have been implicated in both depression and impulsivity, potentially paralleling findings that link impulsive suicide to these same neurotransmitter systems (e.g., Carver et al., 2008; Brent & Mann, 2005). More work is needed to empirically link biological mechanisms, psychopathology, and suicide outcomes.

### **Psychopathic Tendencies, Suicide Risk, and Gender**

In addition to informing the broader literature on suicidality in youth, the present results also contribute to knowledge of the role of psychopathic tendencies in other youth problem behaviors. The extent to which psychopathic traits that emerge in childhood parallel the syndrome in adulthood is a relatively nascent area of study, with additional research needed to establish the nomological network of psychopathic tendencies in youth. This study expands the criterion validity of the psychopathic construct in youth by examining its association with suicidality above the influence of depressive symptoms. Among psychopathic adult inmates, research has linked the antisocial-impulsive dimension to heightened risk for suicide attempts (Verona et al., 2001; Verona et al., 2005) and the

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<sup>5</sup>We investigated whether impulsivity confers suicide risk regardless of the presence of ideation by examining interactive effects between ideation and impulsivity on self-injury or attempts, but we found no effects for either self-injury (Wald = .01,  $p = .91$ ) or attempts (Wald = .03,  $p = .87$ ).

affective-interpersonal dimension to reduced risk for suicide attempts and ideation, respectively, in women (Verona et al., 2005) and men (Douglas et al., 2008)—although there have been some null findings in regards to the affective-interpersonal traits (e.g., Verona et al., 2001). The differential associations for impulsivity and callous-unemotional traits in the present study closely replicate these findings, providing additional support for the construct of psychopathic tendencies in youth and potential similarities to the disorder in adulthood. The present findings make conceptual sense, given recent reports of personality correlates of youth psychopathy. Sadeh et al. (2009) found that whereas low anxiety and aggression characterized the callous/unemotional dimension of the APSD, low trait constraint differentially characterized the Impulsivity dimension. Further, the finding that narcissism did not differentially explain suicidality in the present study may be due to the fact that narcissism is mostly related to social potency (Sadeh et al., 2009) and extroversion (Hall, Benning, & Patrick, 2004). These latter personality traits may not be as relevant to suicidality as are the constructs of impulsivity and callous/ unemotional traits.

The finding that callous-unemotional traits may accord a protective effect for suicide attempts in adolescent girls is in keeping with conceptualizations that psychopathy can be adaptive in some contexts (e.g., Hall & Benning, 2006), including in adolescence (Sadeh et al., 2009). Given that gender differences are rarely studied in relation to psychopathic tendencies in youth (e.g., Verona, Sadeh & Javdani, 2010), another contribution of this study is the relevance of the findings for understanding how psychopathic tendencies may manifest differently for girls. It is unknown why low levels of emotionality decreased risk for suicidality in our sample selectively in girls. One interpretation is that callous/unemotional traits represent greater deviance and prototypicality of psychopathic tendencies for girls than boys (Cruise et al., 2003; Salekin et al., 2001), as these traits are more likely to be discouraged through socialization in girls versus boys (e.g., girls show greater average empathy than boys). Thus, the presence of callousness signals protection from socialization processes in girls more than boys, which may, in turn, reduce tendencies toward emotional distress and engagement in suicidal behaviors among high C/U girls. However, it should be noted that we did not find mean differences in the level of C/U traits in our sample; nonetheless C/U traits had more explanatory power in regards to suicide risk for girls than boys in our sample. Another possibility is that girls at the other end of the emotionality spectrum (i.e., with high emotional dysregulation) are more likely to attempt suicide than boys, whereas boys with similar characteristics are more likely to react to negative emotions in other ways, such as hurting others (e.g., Verona & Kilmer, 2007). This is consistent with the finding that borderline personality disorder, a syndrome associated with suicidality stemming from emotional dysregulation, is more common in women than men (Johnson et al., 2003; Swartz, Blazer, George & Winfield, 1990). Indeed, a higher base rate of suicide attempts in girls overall accords more opportunity to *detect* explanatory variables, such as callous-unemotional traits, because there is potentially greater variability to explain. Thus, callous/unemotional traits may be a protective factor in relation to suicidality in girls, because the link between emotional dysregulation and suicidal acts is stronger for girls than boys. Exploring such gender-specific pathways to suicide may be a fruitful avenue for future research.

Finally, an alternative possibility is that callous/unemotional traits represent a different construct altogether in girls and boys, given demonstrated gender differences in emotional processing among psychopathic individuals (Rogstad & Rogers, 2008). For girls, callous-unemotional traits may be particularly related to low levels of trait nurturance. In support of this, research shows that the relationship between girls' psychopathy scores and aggressive outcomes is mediated by girls' experiences of victimization (Odgers, Reppucci, & Moretti, 2005). The authors suggested that girls' victimization experiences may "lead to an interpersonal disposition and interaction style that may resemble psychopathic traits (e.g.



appear callous and lacking remorse), but are not linked in the same way to the latent construct” (p. 758). Thus, the callous-unemotional construct may be etiologically distinct from the same construct assessed in boys. Though gender differences in callous-unemotional traits could indicate biased responding (i.e., because callous-unemotional traits are in greater discordance with girls’ gender roles, they may be less likely to endorse them), true differences that emerge through socialization and/or biological processes also likely play a role. Future research could directly examine the potential for differential item functioning between males and females on measures of callous-unemotional traits, including by using item response theory or Multiple Indicator Multiple Cause modeling (see Bolt, Hare, Vitale, & Newman, 2004). These approaches allow one to detect biased responding across genders and disentangle the effects of true differences versus differential item functioning.

### Strengths & Limitations

This study has several strengths, including the use of clinician-rated and self-reported risk factors and multiple measures of suicidality. Also, the sample incorporated a relatively wide range of psychopathic traits and was diverse in terms of gender, ethnicity, and socioeconomic status. As with any investigation, however, this study also has limitations. First, there are important considerations regarding the potential representativeness of the sample obtained using two different recruitment strategies (i.e., treatment and community samples combined). Care should be taken to generalize findings to primarily mid-adolescents who represent youth from both treatment-seeking and community-based samples. In addition, the number of youth who engaged in self-injurious and suicidal behaviors was modest, necessitating replication of the findings with larger clinical samples. However, we were able to obtain relatively good representation of suicide-related behaviors in our sample of youth (e.g., almost 20% had engaged in self-injurious behaviors) despite examining a low base rate phenomenon.

Also, our measure of general suicide risk marked by ideation, plans and threats (the SBQ-R) included a double-barreled item that asks about thoughts *or* attempts (“Have you ever thought about or attempted to kill yourself?”), raising concerns about the specificity of this measure. However, analyses on the SBQ-R removing this item produced the same results. We also did not ask participants whether their suicidal behavior was planned out or impulsive in nature, and different results may have emerged if we had examined planned versus impulsive suicidal behaviors. However, given that we studied adolescents, who are more likely to be impulsive, the findings of this study may be quite relevant for adolescence.

Importantly, we note that our design was cross-sectional and postdictive, because our suicide outcomes occurred in the past (i.e., past year or lifetime), so care should be taken in interpreting results (i.e., explanatory variables are not *predictors* of suicide in this study). Future work can involve prospective designs to examine the temporal sequence of depression, psychopathic traits, ideation, and suicidal behaviors. Finally, while the APSD is an oft-used instrument recommended for adolescents in particular, it is characterized by moderate stability, though this level of stability is typical (Frick et al., 2000). Indeed, we do not find strong agreement between the parent and youth versions of the APSD, and one of the reasons for this may be due to instability in the measurement of psychopathic traits using the APSD. It is also possible that our results may be specific to the youth-reported APSD, and thus an important area for future research is replication and extension of these findings using other measures of psychopathy.

Despite these limitations, the results of the current study provide important information about the role of youth-relevant mental health indicators and their relation to suicidal thoughts and behaviors. Specifically, they indicate that depression and impulsivity confer risk for suicidal ideation and self-injurious behavior/ suicide attempts in youth, respectively.

The importance of psychopathic tendencies in the form of callous-unemotional traits was revealed for girls, in that they were protective of suicide attempts in girls but not boys. These data, thus, extend our lens for risk and protection in regards to youth suicide.

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**Table 1**  
**Demographic Characteristics and Descriptive Statistics for the Total Sample and Girls and Boys Separately**

Demographic Variables	Total Sample (N = 184)			Girls (n = 100)			Boys (n = 84)			Gender Difference Test
	Frequency	%		Frequency	%		Frequency	%		
Sample										
Treatment-Seeking	99	54.3		58	58.0		41	48.8		$\chi^2(1) = 1.55 / ns$
Community	85	45.7		42	42.0		43	51.2		
Age	<i>M (SD)</i>	<i>Min/Max</i>		<i>M (SD)</i>	<i>Min/Max</i>		<i>M (SD)</i>	<i>Min/Max</i>		$t(180) = 1.16 / ns$
	14.3 (1.6)	11.0 / 17.0		14.4 (1.5)	11.0 / 17.0		14.1 (1.6)	12.0 / 17.0		
Ethnicity	Frequency	%		Frequency	%		Frequency	%		$\chi^2(4) = 7.28 / ns$
European-American	115	62.8		61	61.6		54	64.3		
African-American	34	18.6		18	18.2		16	19.0		
Hispanic	10	5.5		3	3.0		7	8.3		
Asian	5	2.7		5	5.1		0	0.0		
Biracial/other	19	10.4		12	12.1		7	8.3		
Family Income	Frequency	%		Frequency	%		Frequency	%		$\chi^2(2) = 3.33 / ns$
\$1 - \$30,000	60	33.1		34	34.3		26	31.7		
\$30,001 - \$60,000	48	26.5		21	21.2		27	32.9		
\$60,001 - \$75,000+	73	40.3		44	44.4		29	35.4		
<b>Measures</b>	<i>M (SD)</i>	<i>Min/Max</i>		<i>M (SD)</i>	<i>Min/Max</i>		<i>M (SD)</i>	<i>Min/Max</i>		
	Total Sample (N = 181)			Girls (n = 100)			Boys (n = 84)			
MDD Symptom Counts	1.1 (2.1)	0 / 11		1.4 (2.5)	0 / 11		.7 (1.5)	0 / 6		$t(174) = 2.23 / p < .05$
APSD Total	12.5 (5.2)	2.0 / 31.0		11.6 (4.9)	2.0 / 27.0		13.5 (5.5)	4.0 / 31.0		$t(178) = -2.47 / p < .05$
APSD C/U	3.5 (2.1)	0.0 / 10.0		3.4 (2.2)	0.0 / 10.0		3.6 (2.0)	0.0 / 10.0		$F(176) = .72 / ns$
APSD NAR	3.8 (2.3)	0.0 / 11.0		3.9 (2.2)	0.0 / 10.0		4.1 (2.5)	0.0 / 11.0		$F(176) = 1.48 / ns$
APSD IMP	4.2 (1.9)	0.0 / 10.0		3.8 (1.7)	0.0 / 9.0		4.7 (2.0)	0.0 / 10.0		$F(176) = 1.93 / p < .01$
Overall Suicide Risk (SBQ-R)	1.3 (0.6)	1.0 / 4.25		1.3 (0.6)	1.0 / 4.25		1.2 (0.5)	1.0 / 3.25		$t(181) = 2.00 / p < .05$
	Frequency	%		Frequency	%		Frequency	%		
Self-Injurious Behavior	34	19.4%		21	21.9		13	15.4		$\chi^2(1) = 1.18 / ns$
Suicide Attempt with Intent	21	12.0%		13	13.5		8	9.0		$\chi^2(1) = .88 / ns$

*Note:* MDD = Major Depressive Disorder assessed with the KSADS (Kaufman et al., 1996). APSD = Antisocial Process Screening Device (Frick & Hare, 2001); C/U = Callous/Unemotional. NAR = Narcissism. IMP = Impulsivity. Range of possible scores is 12, 14, and 10 for Callous/Unemotional, Narcissism, and Impulsivity, respectively. Overall suicide risk was assessed with the Suicide Behavior Questionnaire-Revised (SBQ-R; Osman et al., 2001). Self-Injurious Behavior and Suicide Attempts are categorical variables (0 = no, 1 = yes) and were assessed with a suicide interview adapted from Linehan and Comtois' (1997) Lifetime Parasuicide Count.

**Table 2**  
**Correlations between Antisocial Process Screening Device (APSD) and Suicidality Indicators (N = 181) for Girls (below the diagonal) and Boys (above the diagonal)**

		APSD				Suicide and Self-Harm		
		Total <sup>1</sup>	C/U <sup>2</sup>	NAR <sup>3</sup>	IMP <sup>4</sup>	SBQ-R <sup>5</sup>	Self-Inj <sup>6</sup>	Attempt <sup>7</sup>
<b>Girls</b>	<b>Boys</b>							
<b>1</b>	<b>1</b>	.55**	.84**	.79**	.13	.21	.16	
<b>2</b>	<b>1</b>	.69**	.23*	.13	.12	.01	.11	
<b>3</b>	<b>1</b>	.78**	.27**	.60**	-.02	.15	.06	
<b>4</b>	<b>1</b>	.76**	.30**	.50**	.21	.26**	.19	
<b>5</b>	<b>1</b>	.24*	.00	.20*	.27**	.39**	.49**	
<b>6</b>	<b>1</b>	.17	-.01	.06	.29**	.53**	.74**	
<b>7</b>	<b>1</b>	.04	-.17	.01	.21**	.59**	.75**	

Note: APSD = Antisocial Process Screening Device (Frick & Hare, 2001), C/U = Callous/Unemotional, NAR = Narcissism, IMP = Impulsivity, SBQ-R = Suicide Behavior Questionnaire – Revised (Osman et al., 2001), Self-Injurious Behavior and Suicide Attempts are categorical variables (0 = no, 1 = yes) and were assessed with a suicide interview adapted from the Lifetime Parasuicide Count (Linehan & Comtois, 1997).

\*  $p < 0.05$

\*\*  $p < .01$ .

**Table 3**  
**Regression of Suicidality Indicators on the Antisocial Process Screening Device (APSD) Facets, MDD Symptom Counts, and Gender**

	Overall Suicide Risk (SBQ-R)			Self-Injurious Behavior			Suicide Attempt with Intent to Die		
	*β	R <sup>2</sup>	ΔR <sup>2</sup>	-2LL	Step χ <sup>2</sup>	Wald	-2LL	Step χ <sup>2</sup>	Wald
<b>Block 1</b>		.10		137.05	15.20 <sup>**</sup>		94.12	18.91 <sup>**</sup>	
Age	.23 <sup>**</sup>					9.52 <sup>**</sup>			12.13 <sup>**</sup>
Family Income	-.19 <sup>*</sup>					4.35 <sup>*</sup>			3.83 <sup>*</sup>
Gender	-.11					.63			.34
<b>Block 2</b>		.23	.13 <sup>**</sup>	131.46	5.59 <sup>*</sup>		88.37	5.75 <sup>*</sup>	
Age	.17 <sup>*</sup>					7.54 <sup>**</sup>			10.18 <sup>**</sup>
Family Income	-.12					2.57			1.96
Gender	-.05					.21			.04
MDD Symptoms	.38 <sup>**</sup>					5.56 <sup>*</sup>			5.58 <sup>*</sup>
<b>Block 3</b>		.24	.02	119.62	11.84 <sup>**</sup>		76.23	12.14 <sup>**</sup>	
Age	.17 <sup>*</sup>					8.91 <sup>**</sup>			11.10 <sup>**</sup>
Family Income	-.10					2.51			3.17
Gender	-.09					2.42			1.99
MDD Symptoms	.35 <sup>**</sup>					1.69			1.53
APSD C/U	-.01					1.28			3.19
APSD NAR	.01					.07			.89
APSD IMP	.13					9.05 <sup>**</sup>			9.24 <sup>**</sup>
<b>Block 4</b>		.26	.02	118.60	1.02		71.28	4.94	
Age	.19 <sup>**</sup>					8.74 <sup>**</sup>			10.89 <sup>**</sup>
Family Income	-.10					2.38			3.44 <sup>m</sup>
Gender	-.10					1.62			.52



	Overall Suicide Risk (SBQ-R)			Self-Injurious Behavior			Suicide Attempt with Intent to Die		
	*β	R <sup>2</sup>	ΔR <sup>2</sup>	-2LL	Step χ <sup>2</sup>	Wald	-2LL	Step χ <sup>2</sup>	Wald
MDD Symptoms	.33 <sup>***</sup>					1.99			.94
APSD C/U	-.02					1.33			2.83
APSD NAR	-.01					.00			.86
APSD IMP	.16					8.08 <sup>***</sup>			8.92 <sup>***</sup>
Gender x C/U	.10					.04			3.98 <sup>*</sup>
Gender x NAR	-.13					1.01			.35
Gender x IMP	.01					.19			.44

Note. MDD = Major Depressive Disorder. APSD = Antisocial Process Screening Device. C/U = Callous/Unemotional. NAR = Narcissism. IMP = Impulsivity. Overall suicide risk marked by ideation, plans, and threats was assessed with the Suicide Behavior Questionnaire – Revised (SBQ-R; Osman et al., 2001). Self-Injurious Behavior and Suicide Attempts are categorical variables (0 = no, 1 = yes) and were assessed with a suicide interview adapted from the Lifetime Parasuicide Count (Linehan & Comtois, 1997). -2LL = -2 log likelihood, significant decreases from the previous model represent improvement in model fit. χ<sup>2</sup> = chi-square is an estimate of the increment in variance explained provided by the particular step of the model (inclusion of new block to the model). Wald = this is a test of the variable's independent contribution to the postdiction of suicide attempts, after holding other explanatory variables constant.

m = p < .07.

\* p < 0.05

\*\*\* p < .01