

Psychopathic Traits, Substance Use, and Motivation to Change:

An Integrative Approach with Juvenile Offenders

by

Christopher Gillen

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Abstract

This study investigated the relationship between psychopathy and substance use (SU) and their interaction with motivation to change in predicting risk. Fifty-five adolescent offenders who admitted to using drugs or alcohol at least one time before their index offense were recruited from a south-eastern U.S. detention centre/court. Results indicated that psychopathy was related to a younger age of SU onset and increased severity of SU. However, this relationship appeared to be dependent on the self-report measure of psychopathy used. Psychopathy was only related to increased risk when motivation to change was low, even after controlling for the main effect of SU onset. These results offer initial support that psychopathy, SU, and motivation can be used as part of an integrative approach when working with juvenile offenders. However, more research is needed before such an approach can be used to inform long-term risk predictions or in planning specific treatment plans.

Dedication

This thesis is dedicated to my mother for her outstanding support and love throughout my life.

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Psychopathic Traits, Substance Use, and Motivation to Change: An Integrative Approach
with Juvenile Offenders

Although crime rates have been decreasing in Canada and the United States since the 1990s (Knoll & Sickmund, 2012; National Crime Prevention Centre, 2012), crime is still a serious issue negatively affecting victims and society. This is especially true of juvenile offending, particularly for violent offenses. While juvenile crime has been decreasing in Canada since 2002, the severity of juvenile violent offending has increased by 5% from 2000 to 2010, with juvenile offenders committing more violent crime proportional to adult offenders (National Crime Prevention Centre, 2012). In the U.S., offenses committed by juveniles have increased by 63% from 1985 to 2009 (Knoll & Sickmund, 2012). Furthermore, within seven years of leaving prison, research has found that juvenile offenders have general recidivism rates approaching 60% and violent recidivism rates close to 36% (Olver, Stockdale, & Wong, 2012).

Consequently, it is important to understand the risk and responsivity factors related to juvenile delinquency in order to improve forensic assessment and treatment directions that can help reduce recidivism. Two such risk factors are psychopathy and substance use (SU). Psychopathy has been found to be a predictor of antisocial behaviour and violence in youth (Edens, Campbell, & Weir, 2007; Leistico, Salekin, DeCoster, & Rogers, 2008; Stockdale, Olver, & Wong, 2010) and is predictive of reduced treatment amenability and increased recidivism (Leistico & Salekin, 2003; O'Neil, Lidz, & Heilbrun, 2003). Substance use/abuse is also predictive of adolescent recidivism, particularly for alcohol use (Stoolmiller & Blechman, 2005), as well as increased risk for adult persistent crime patterns (Murphy, Brecht, Huang, & Herbeck, 2012; Windle &

Wiesner, 2004). Early SU onset is also associated with increased antisocial behaviour during adolescence (Gordon, Kinlock, & Battjes, 2004).

However, having one or more risk factors does not guarantee that an individual will offend or recidivate. Responsivity factors also exist that promote resilience and increase the likelihood of positive responses to treatment. One such factor related to increased treatment amenability and reduced risk to offend in youth is motivation to change criminal behaviour (Salekin, Rogers, & Ustad, 2001; Salekin, Yff, & Neumann, 2002). In terms of adolescent SU, juvenile offenders often have low motivation to complete substance abuse (SA) treatment programs that can reduce recidivism (Clair et al., 2011; Wisdom, Cavaleri, Gogel, & Nacht, 2011), while less motivated youth with psychopathic traits display higher recidivism rates than comparable highly motivated youth (Salekin, Lee, Schrum Dillard, & Kubak, 2010).

The current study aims to investigate how psychopathy, SU, and motivation to change interact to predict risk for offending with an adolescent offender sample. This study will also extend research examining the relationship between psychopathy and SU. Specifically, it will examine how different aspects of SU are related to self-report measures of psychopathy and if the relationship is consistent across level of risk. How alcohol use interacts with psychopathic traits and reactive violence will also be investigated. Furthermore, it is the first study to examine how motivation to change affects the relationship between SU and psychopathy in predicting risk in adolescents. By doing so we can begin to understand the nature of the relationship between these factors and form a more integrative approach when working with juvenile offenders. In the following sections, the constructs investigated in the present study are reviewed.

Psychopathy

Development and assessment. While there has been debate about the construct of psychopathy throughout history (Gough, 1948), the conventional understanding of the construct as a personality disorder was promoted by Cleckley in his classic book *The Mask of Sanity: An attempt to clarify some issues about the so-called psychopathic personality* (Cleckley, 1964; originally published in 1941). Using clinical interviews as case studies, many with offenders, Cleckley noted 16 psychopathic characteristics related to emotional and interpersonal deficiencies that separated psychopathy from other mental illnesses. These traits were marked by displays of superficial charm and the ability to make a positive first impression, and also involved displays of antisociality, pathological lying, and manipulation. Cleckley (1964) noted psychopaths exhibited these characteristics without displays of remorse which typically follow hurtful actions towards others. These individuals were also characterized by excessive vanity and impulsiveness combined with a lack of long-term planning. Most notably, however, Cleckley presented the psychopath as appearing normal and fully functional in society in what he termed a mask of sanity.

The description of psychopathy presented by Cleckley (1964) was further refined with the creation of a 20-item clinical rating scale known as the Psychopathy Checklist (PCL; Hare & Frazelle, 1980) and its revised version (PCL-R; Hare, 2003). While there has been conflicting research on the factor structure of the PCL-R (e.g., Cooke & Michie, 2001; Cooke, Michie, & Skeem, 2007; Walters, 2012), there seems to be support for a higher order two factor model composed of four facets (Hare & Neumann, 2008; Neumann, Johansson, & Hare, 2013). According to this model, the personality traits

associated with psychopathy (Factor 1) are made up of interpersonal (facet 1) and affective (facet 2) features while the behavioural traits (Factor 2) are composed of lifestyle (facet 3) and antisocial (facet 4) characteristics. Interpersonal traits include superficial charm, grandiose sense of self, and manipulation while affective traits include remorselessness, shallow affect, and callousness. The lifestyle facet is composed of traits such as stimulation seeking, impulsivity, and irresponsibility while the antisocial facet includes poor behaviour control, criminal versatility, and early behavioural problems. Research investigating the adolescent adapted version of the PCL-R, the Psychopathy Checklist: Youth Version (PCL:YV; Forth, Kosson, & Hare, 2003), also supports the four-factor model (Das, de Ruiter, Doreleijers, & Hillege, 2009; Kosson et al., 2013; Neumann, Kosson, Forth, & Hare, 2006).

Even though most studies have found that the PCL:YV is a reliable and valid measure of psychopathic traits in adolescents (Dillard, Salekin, Barker, & Grimes, 2013; Lee, Vincent, Hart, & Corrado, 2003; Silva, Genovés, & Latorre, 2012), there is growing support for the use of self-report measures to assess psychopathic traits in adolescents. This is particularly true of the self-reported Youth Psychopathic Traits Inventory (YPI; Andershed, Kerr, Stattin, & Levander, 2002) and the Antisocial Process Screening Device (APSD; Frick & Hare, 2001). Unlike the APSD which was designed as a screening measure to assess both personality and behavioural traits related to psychopathy, the YPI was created to measure the core personality features of the construct to the exclusion of antisocial traits related to criminal behaviour (Andershed et al., 2002). Nonetheless, the two scales have comparable factor structures that are significantly correlated together.

Research investigating the YPI has found support for a three-factor structure comparable to the interpersonal (Grandiose-Manipulative), affective (Callous-Unemotional; CU), and lifestyle facets (Impulsive-Irresponsible) of the PCL:YV (Declercq, Markey, Vandist, & Verhaeghe, 2009). Similarly concurrent Narcissism, CU, and Impulsivity factors in incarcerated adolescents have been identified with the APSD (Vitacco, Rogers & Neumann, 2003). While a recent study found that the APSD may not assess CU traits accurately (Dillard et al., 2013), other studies have found that when two CU items (“does not show emotions” and “keeps the same friends”) are removed from the measure, the fit of the three-factor model is similar to YPI (Poythress, Dembo, Wareham, & Greenbaum, 2006). Given the comparable factor structure, it is not surprising that both APSD and YPI total ($r = .77$), interpersonal ($r = .63$), affective ($r = .47$), and impulsive factors ($r = .57$) are moderately to strongly correlated together (Seals, Sharp, Ha, & Michonski, 2012).

The APSD has also been used as a parent and teacher rated measure, often in younger school aged children. Items in both the self-report and observer rated versions are identical and the observer rated version has also been found to display a three-factor structure (Bijttebier & Decoene, 2009). Parent and self-report versions also are related, with research identifying moderate correlations between the total ($r = .41$), Narcissism ($r = .31$), CU ($r = .26$), and Impulsivity ($r = .37$) factors (Sadeh, Verona, Javdani, & Olson, 2009). Kimonis, Frick, Fazekas, and Loney (2006) also found that total parent and self-report APSD scores were significantly correlated ($r = .54$).

Similar to the APSD, the Childhood Psychopathy Scale (CPS; Lynam, 1997) was designed as both a self-report and observer rated measure of psychopathy. However, like

the YPI the CPS was designed to assess the personality features captured by the PCL-R to the exclusion of items representing criminal versatility and juvenile delinquency. Related to this personality focus, factor analysis research has found support for a two-factor model assessing the interpersonal/manipulative and affective/callous traits related to Factor 1 of the PCL:YV in the observer rated measure (Bezdjian, Raine, Baker, & Lynam, 2011). Three-factor models analogous to the APSD have also been identified (Douglas, Epstein, & Poythress, 2008; Spain, Douglas, Poythress, & Epstein, 2004), while other research has identified a two-factor model comparable to the PCL-R (Bijttebier & Decoene, 2009). Research comparing the three-factor self-report CPS and APSD found that total scores were strongly correlated ($r = .79$) and that factor scores were moderately correlated together ($r_s = .38 - .60$; Douglas et al., 2008).

Normative features and the labelling effect. Even though the assessment of psychopathy in juvenile populations is improving, with established self-report, observer, and clinical rating measures, some controversies about the subject still remain. Unlike adult psychopathy, there have been criticisms that the construct could be overrepresented in youth. Such criticisms are based on evidence that some psychopathic traits, such as a lack of empathy and remorse, grandiosity, a failure to accept blame, and impulsivity, are not abnormal in youth and are of a transitory nature (Seagrave & Grisso, 2002). As opposed to adults, when adolescents exhibit these characteristics it may be because they have not yet fully developed the higher-order abilities designed to regulate these traits.

Seagrave and Grisso (2002) contend that these traits can be mistakenly attributed as enduring psychopathic characteristics in juveniles who are still developing and undergoing maturational change. Consequently, the authors believed this would have

serious implications for the juvenile justice system. Petrila and Skeem (2003) noted that psychopathy in youth could be used to incorrectly label certain juvenile offenders as untreatable and persistently dangerous while Penny and Moretti (2005) cautioned that psychopathy could become instrumental in juvenile transfers to adult court in the U.S., a system based more on incarceration as opposed to rehabilitation.

Research investigating juvenile offenders has found some support for these claims. In both Canada and the U.S., psychopathy has been introduced as evidence in court in over 100 published cases as of 2010 (Viljoen, MacDougall, Gagnon, & Douglas, 2010). While these admissions did not appear to bias legal decisions in Canada or the U.S., evidence of psychopathy was used to infer that certain young offenders were at higher risk for violence and recidivism and that treatment would be less successful.

Consistent with the predictions of Penny and Moretti (2005), Viljoen et al. (2010) also found that the most common use of psychopathy as evidence in the criminal justice system was in transfer cases to adult court in the U.S. and adult sentencing in Canada. Interestingly, recent research using aggregated data from adult and juvenile capital murder cases found that laypeople were more likely to approve of the death penalty and less likely to support treatment for offenders when psychopathy, particularity Factor 1 traits, were entered into standardized case descriptions (Edens, Davis, Fernandez Smith, & Guy, 2013).

Stability of psychopathic traits. The criticism established by Seagrave and Grisso (2002) and resulting juvenile justice implications are dependent on the notion that adolescent psychopathy is transient and not an accurate longitudinal predictor of risk. While there appears to be individual variation in stability, with some youth showing

decreases in psychopathic traits overtime on average (Kimonis, Skeem, Cauffman, & Dmitrieva, 2011; Pardini & Loeber, 2008), research has indicated that juvenile psychopathic traits are relatively stable, show little temporal fluctuation, and are not solely transient expressions of normal maturation (Feilhauer, Cima, & Arntz, 2012; Muñoz, Kerr, & Besic, 2008; Neumann, Wampler, Taylor, Blonigen, & Iacono, 2011; van Baardewijk, Vermeiren, Stegge, & Doreleijers, 2011).

In a study investigating a community sample of adolescents (age 12-15), total YPI scores showed a moderate to high degree of stability as measured by interclass correlation coefficients (ICC) over four years (.52- .67; Muñoz et al., 2008). More recent research by Feilhauer et al. (2012) also identified CU traits, features more closely associated with the affective facets of psychopathy, as showing strong stability in incarcerated Dutch adolescents over a 43 week period. Similarly, Pechorro, Maroco, Poiares, and Vieira (2013) found that total self-reported APSD scores in incarcerated Portuguese adolescents demonstrated strong short-term stability over a three month follow up ($r = .80$).

Apart from short-term stability, longitudinal research investigating children and adolescents from the Pittsburgh Youth Study (PYS; Loeber, Farrington, Stouthamer-Loeber, & Van Kammen, 1998) revealed that psychopathic personality traits were stable from childhood into adolescence (Lynam et al., 2009; Obradovic, Pardini, Long, & Loeber, 2007). Specifically, Lynam et al. (2009) found that self-reported CPS total scores showed little temporal fluctuation over annual assessments of youth from seven years of age until 18 years of age, even after a five year follow up (average ICC = .56). A similar study examining parent and teacher ratings of CU traits in PYS participants (8-16 years

old) found that parent reports were moderately to strongly correlated between three and eight year follow ups ($r = .50 - .74$), while teacher ratings were less stable ($r = .27 - .53$; Obradovic et al., 2007).

However, subsequent analyses by Lynam et al. (2009) and Pardini and Loeber (2008) revealed that *mean* CPS scores and parent/teacher CU ratings increased in mid-adolescence and decreased as participants approached adulthood. Pardini and Loeber (2008) also noted that there were individual differences in stability, with some youth showing decreases in callousness whereas others showed increases. While these findings are based entirely on PYS data, more recent research investigating incarcerated offenders (14 to 17 years of age) from a north-eastern U.S. detention centre found similar results over a two year follow up (Kimonis et al., 2011). Kimonis and colleagues found that mean total PCL:YV scores decreased as youth approached adulthood.

While these studies suggest that psychopathic traits may have some plasticity, particularly during mid to late adolescence, other research has discovered that adolescent psychopathic traits remain stable during this formative transition period from adolescence to adulthood. Lynam, Caspi, Moffitt, Loeber, and Stouthamer-Loeber (2007) found that adolescent psychopathy as measured by the observer rated CPS was moderately stable over 11 years into adulthood in a longitudinal study investigating youth from the YPS. This was especially true of the behavioural aspects of psychopathy, including the lifestyle and antisocial traits. More recently, Neumann et al. (2011) found that the behavioural traits were the most stable over two measurement periods at 17 and 23 years of age.

These findings suggest psychopathic traits in youth are not solely transient expressions related to normal maturation as proposed by Seagrave and Grisso (2002), but

they do not invalidate the associated concerns. Because there are individual differences in stability and decreases in psychopathy during adolescence in terms of mean psychopathy ratings (Kinonis et al., 2011; Lynam et al., 2009; Pardini & Loeber, 2008), it is still important to avoid assuming psychopathy is stable in all youth. This is particularly true when assessing the construct in individuals for court recommendations or treatment decisions. Together these findings suggest that juvenile psychopathy is a unique construct with sufficient temporal stability to predict long term forensic implications as well as some plasticity that could allow the construct to be successfully targeted with treatment.

Juvenile psychopathy and the criminal justice system. Similar to adult offenders (Olver, Lewis, & Wong, 2013; Porter & Woodworth, 2007; Wallinius, Nilsson, Hofvander, Anckarsater, & Stalenheim, 2012), research has found that psychopathic traits are moderately related to present and future displays of antisocial and criminal behaviour (Edens, Skeem, Cruise, & Cauffman, 2001). In particular, research examining the PCL:YV has found that psychopathy is predictive of violent and criminal recidivism and is prevalent in 12-15% of a delinquent boys (Murrie & Cornell, 2002; Vincent, Vitacco, Grisso, & Corrado, 2003) and 8.8% of girls (Schrum & Salekin, 2006) using a traditional adult cut-off score at or above 30.

A meta-analysis by Olver, Stockdale, and Wormith (2009) investigating the relationship between the PCL:YV and recidivism across 28 different aggregated studies found psychopathy to be predictive of antisocial behaviour. Even though the effect sizes of the correlations between the PCL:YV and recidivism showed significant variability across studies, the meta-analysis revealed that mean weighted correlations between the PCL:YV and general ($r = .28$) and violent recidivism ($r = .25$) were significant and

showed moderate effect sizes. Correlations were weaker, but still significant, between psychopathy and nonviolent recidivism ($r = .16$), however no significant relationship was detected between sexual recidivism and psychopathy. Similarly, a recent review of the PCL:YV found that the measure predicted nonsexual violent and general recidivism with moderate accuracy, but was not a strong predictor of future sexual offending (Hempel, Buck, Cima, & van Marle, 2013).

While psychopathy has traditionally been associated with proactive aggression, a recent review by Berg and colleagues (2013) noted that psychopathy is related to both predatory and reactive forms of violence. In young offenders, the interpersonal and personality features of the construct are associated with instrumental, planned, and predatory forms of aggression whereas antisocial traits are related to reactive forms of violence (Flight & Forth, 2007; Vitacco, Neumann, Caldwell, Leistico, & Van Rybroek, 2006), similar to the adult construct.

While some studies have found that the PCL:YV is unrelated or weakly related to long-term recidivism (Cauffman, Kimonis, Dmitrieva, & Monahan, 2009; Edens & Cahill, 2007), most research has found that the PCL:YV can predict recidivism into adulthood (Gretton, Hare, & Catchpole, 2004; Schmidt, Campbell, & Houlding, 2011; Stockdale et al., 2010). Across all recidivism types, Factor 2 traits seem to be the best predictors of long-term recidivism, with antisocial traits being the strongest predictor of adult violent recidivism ($r = .44$; Stockdale et al., 2010). Even though Caucasians, Aboriginals, and African-Americans show similar risk trajectories based on adolescent psychopathic traits (Schmidt, McKinnon, Chattha, & Brownlee, 2006; Stockdale et al., 2010; Vachon, Lynam, Loeber, & Stouthammer-Loeber, 2012), the association between

psychopathy and adult recidivism is weaker in adolescent female offenders (Schmidt et al., 2011; Stockdale et al., 2010).

While most studies have found that the PCL:YV can predict antisocial outcomes in adolescents through adulthood, other research has identified that self-report and observer ratings of adolescent psychopathic traits, such as the APSD or YPI, can also be effective at predicting risk and recidivism. Even though some studies found that the APSD does not predict recidivism as well as the PCL:YV (Boccaccini et al., 2007; Murrie, Cornell, Kaplan, McConville, & Levy-Elkon, 2004), these studies noted that the APSD was a significant predictor of violence and recidivism. Murrie et al. (2004) found that the self-report APSD was moderately correlated with criminal records of violence, self-report violence, and violence while incarcerated ($r_s = .22- .30$), while Boccaccini et al. (2007) found that APSD total, Narcissism, and Impulsivity scores were moderately related to committing an offense one year after release from detention ($r_s = .23- .25$). However, only the APSD Impulsivity factor was significantly related to committing a weapons offense after release ($r = .22$; Boccaccini et al., 2007). Other studies have even found that the self-report APSD has improved predictive ability to measure risk over the PCL:YV. Investigating Canadian juvenile offenders, Spain and colleagues (2004) found that only APSD scores significantly predicted institutional aggression while Douglas and colleagues (2008) found that only the APSD predicted recidivism when both the APSD and PCL:YV were compared.

In a study investigating the self-report and parent observer APSD, Falkenbach, Poythress, and Heide (2003) found that total scores and CU and Impulsivity factors were moderately correlated with general recidivism after a one year follow up, with parent

rated total and Impulsivity scores showing the strongest relationship ($r_s=.40$). In a subsequent study utilizing the parent rated APSD to assess CU traits in a high risk U.S. school sample, McMahon, Witkiewitz, and Kotler (2010) found that CU traits predicted multiple antisocial outcomes after controlling for the effects of conduct disorder (CD), oppositional defiant disorder (ODD), and attention deficit hyperactivity disorder (ADHD). Specifically, parent reported CU traits in the seventh grade predicted adolescent delinquency, both juvenile and adult arrests, and diagnoses of adult antisocial personality disorder (APD) after youth were reassessed two years after leaving high school, suggesting that adult antisocial outcomes are not only predicted by the behavioural features of psychopathy.

Research investigating the YPI has found similar results. Consistent with McMahon et al. (2010), a study investigating incarcerated adolescent offenders three years after release from the south-eastern U.S. found that violent recidivism was moderately correlated with YPI interpersonal ($r=.20$) and affective traits ($r=.32$), however the YPI was not significantly associated with nonviolent forms of reoffending (Salekin, Debus, & Barker, 2010). Conversely, recent research by Colins, Vermeiren, De Bolle, and Broekaert (2012) found that YPI total and component scores were not related to severity of adolescent recidivism, violent recidivism, or serious nonviolent recidivism (i.e., burglary) after an average 3.3 year follow up. However, the impulsive/behavioural and interpersonal traits as measured by the YPI were significantly related to dichotomous ratings of adolescent substance related recidivism. When the YPI and PCL:YV were compared directly in their ability to predict antisocial behaviour, Dolan and Rennie (2006) found that only the PCL:YV significantly correlated with rates of general and

violent institutional infractions. When the base rates for both general and violent infractions were controlled for, the YPI Impulsive-Irresponsible factor was significantly related to both infraction types, however the PCL:YV was still a better predictor of institutional infractions than the YPI.

Other research, however, has found that the YPI is a robust predictor of antisocial behaviour similar to the APSD and PCL:YV. In a study investigating the YPI in a sample of adolescents from a high school in Belgium, Declercq and colleagues (2009) found that YPI total and factor scores were significantly related to the commission of violent offenses, property offenses, vandalism, drug use, criminal versatility, and increased severity of violent and property crime in both boys and girls. Similar to the PCL:YV, violent crime outcomes and criminal versatility were most strongly related to the behavioural Impulsive-Irresponsible factor of the YPI in boys. Together, these results suggest that the APSD and YPI can be used to predict aspects of risk and recidivism with adolescents. However, caution should still be exercised when using these measures because predictions may not be as consistent as the PCL:YV and little research has investigated the utility of self-report measures to predict adult crime trajectories.

Evidence investigating the PCL:YV, APSD, and YPI shows that adolescent psychopathic traits are predictive of risk and long term offending patterns that are of concern for the juvenile justice system. This is especially true of male offenders and the antisocial/behavioural components of psychopathy and supports the notion that the relative stability of psychopathic traits throughout the lifespan is related proportionately to future risk. Like adults, the interpersonal and affective features of the construct appear to be related with instrumental and predatory aggression. However, not all adolescents

with psychopathic traits will commit future crime or violence. These differences in stability and increased plasticity of psychopathic traits during mid-late adolescence highlight the need to be cautious when making longitudinal risk predictions or assigning permanent labels to offenders based solely on adolescent psychopathic traits.

Furthermore, this plasticity is encouraging for the criminal justice system, as the instability may provide a window of opportunity during childhood and adolescence where psychopathic traits, and the antisocial behaviour associated with them, can be effectively targeted with treatment.

Treatment and psychopathy in youth. While conventional understanding suggested that treatment of adult offenders with psychopathic traits was ineffective and could even *increase* violent recidivism (Harris & Rice, 2006), more recent research has found conflicting evidence. Hildebrand and de Ruiter (2012) found that PCL-R scores were related to reduced treatment compliance in male forensic psychiatric patients, while other research identified Factor 1 psychopathic traits, especially the affective features, as being related to reduced treatment effectiveness (Olver & Wong, 2011) and likelihood of therapeutic change (Olver et al., 2013).

Conversely, research has also identified that treatment can reduce risk and recidivism in adult offenders with psychopathic traits, especially treatments of high intensity and longer duration (Langton, Barbaree, Seto, & Peacock, 2006; Looman, Abracen, Serin, & Marquis, 2005). A recent review has also found support for cognitive-behavioural treatments with offenders with psychopathic traits (Wong, Gordon, Gu, Lewis, & Olver, 2012). Specifically, Wong et al. (2012) found that decreases in risk measured during treatment were predictive of reductions in sexual and violent recidivism

after release while those offenders who did recidivate often were given shorter prison sentences reflective of less serious crimes.

With the increased temporal instability of psychopathic traits in adolescence and increased comorbidity with internalizing disorders such as anxiety and depression (Kubak & Salekin, 2009; Price, Salekin, Klinger, & Barker, 2012), it is possible that treatment could be more effective in youth with psychopathic traits than offenders displaying the adult equivalent of the construct. Even though some studies have found that youth with psychopathic traits do not respond to treatment and often show reduced treatment compliance and poor participation (Falkenbach et al., 2003; O'Neil et al., 2003), most research supports the efficacy of early therapeutic interventions when compliance is maintained (Caldwell, Skeem, Salekin, & Van Rybroek, 2006; Caldwell, McCormick, Wolfe, & Umstead, 2012; Lee, Salekin, & Iselin, 2010).

Gretton, McBride, Hare, and O'Shaughnessy (2000) conducted one of the first studies to investigate the effect of psychopathy on treatment outcomes of an outpatient sex offender treatment program for adolescent male offenders. The PCL:YV was used to assess psychopathy and was coded retrospectively from file information after a 10 year follow up. Consistent with prior compliance research, 80% of offenders with high PCL:YV scores who did not complete treatment recidivated violently within 10 years, whereas only 30% of comparable youth violently reoffended after successfully completing treatment. Rogers, Jackson, Sewell, and Johansen (2004) also found that a general educational therapy designed to target SA and behaviour problems rather than psychopathic traits also was unexpectedly related to significant reductions in the display of psychopathic traits as measured by the self-report SALE (Rogers, Vitacco, Cruise,

Sewell, & Neumann, 2002) over a six month period in 25.9% of adolescents from a Texas state hospital.

While these studies suggest that treatment can be effective with youth with psychopathic traits, they were not without limitations. One of the central limitations of both studies was that they did not compare the treatment group to an appropriate control group. Consequently, the positive effects of treatment could not be separated from other explanations of improvement. For example, the reductions in antisocial behaviour found by Gretton et al. (2000) could have been due to the instability of psychopathic traits during adolescence. Furthermore, differences in recidivism between those who completed and did not complete sex offender treatment could have been caused by intrinsic differences between offender groups, such as motivation to change, rather than the treatment itself.

To address this issue, Caldwell et al. (2006) investigated two groups of adolescent offenders who scored high on the PCL:YV ($M > 27$) but received different types of treatment. One group of offenders from the Mendota Juvenile Treatment Center (MJTC; $n = 56$) in Wisconsin received specialized high intensity treatment that targeted antisocial interactions and interpersonal aggression using a cognitive-behavioural model while a control group received less intensive, standardized treatment ($n = 85$). Rate of recidivism for a variety of offense types as well as time spent in the community before reoffending were assessed to measure treatment effectiveness over a two year period following release. While the MJTC treatment did not reduce general recidivism (i.e., property and drug offenses), the effectiveness of the higher intensity treatment to reduce recidivism increased as offense severity increased. MJTC treatment was most effective at

reducing violent recidivism compared to control treatment, and was related to longer time spent in the community before reoffending.

More recent research has investigated the effects of specific psychopathic traits on adolescent MJTC treatment outcomes. After treatment, Caldwell (2011) found that interpersonal, affective, lifestyle, and antisocial psychopathic traits as measured by the PCL:YV were related to decreases in both general and violent recidivism over an average 54 month period after release when compared to control. Interpersonal traits were found to be particularly salient in terms of treatment outcomes. After follow up, the interpersonal facet predicted violent reoffending in the control group but not in the treatment group. Within the treatment group the relationship between interpersonal traits and poor behaviour was not found after follow up.

A subsequent study by Caldwell and colleagues (2012) investigated the effects of the MJTC treatment on psychopathic traits as measured by the self-reported APSD. Psychopathic traits were rated at and after 90 and 180 days from intake and were found to decrease over the three time periods, even the narcissistic and CU traits. Of those adolescents who completed the full 180 days, decreases in the Narcissism, CU, and Impulsivity factors resulted in improved clinical ratings of institutional behaviour and treatment compliance. Together, the findings from both studies suggest that core personality features related to adolescent psychopathy, such as callousness and grandiosity, can be successfully targeted by intensive cognitive-behavioural treatment that focus on interpersonal functioning. While these studies do not isolate the specific MJTC factors which contributed to treatment success, they do suggest that treatment can

reduce recidivism in youth with psychopathic traits while reducing the expression of these traits, particularly the interpersonal features.

While most research has investigated and supported different cognitive-behavioural based treatments for use with adolescent offenders, parent training has shown to be effective with children displaying CD and psychopathic traits (McDonald, Dodson, Rosenfield, & Jouriles, 2011). McDonald et al. (2011) assigned families (mothers and young children under nine years of age) who were victims of domestic violence to either a parent training program which included child management criteria or a control group which did not receive training. Psychopathy was assessed in youth at six separate intervals using the mother-rated APSD over a 20 month period. McDonald et al. found that the children of mothers who received parental training showed reductions in APSD Narcissism and CU factor scores over time compared to controls, even after controlling for conduct problems. Improved consistency of parenting mediated the relationship between treatment and psychopathy.

While research investigating juvenile psychopathy and treatment is an emerging field, most of the research to date suggests that psychopathic traits in children and adolescents can successfully be reduced and targeted to decrease recidivism using a variety of high intensity treatments inside criminal justice settings. This is especially true of the personality traits most closely associated with instrumental aggression. Such evidence supports theories that the plasticity of psychopathic traits in adolescents may make these types of juvenile offenders more amenable to treatment compared to adult offenders. However, risk and treatment considerations involving adolescent offenders often incorporate additional factors and do not view psychopathy in isolation of these

factors. While co-occurring disorders such as anxiety and CD are often considered when analyzing psychopathy in youth (i.e., Lee et al., 2010; Tatar, Cauffman, Kimonis, & Skeem, 2012), a growing body of research has also begun to investigate how psychopathic traits interact with other established risk factors, such as substance use and abuse.

Substance Use and Abuse in Children and Adolescents

Prevalence of substance use and abuse. The use of substances such as alcohol and other illicit drugs is a troubling factor within the juvenile justice system. Juvenile offenders display significantly higher rates of SU and dependence compared to the general juvenile population (Golzari, Hunt & Anoshiravani, 2006; Mulvey, Schubert, & Chassin, 2010). Golzari et al. (2006) noted that SA prevalence in juvenile correctional environments can be as high as 59% while a more recent study investigating the causal pathways of delinquency in American adolescents found that 37% of boys and 35% of girls had met criteria for an Axis I SA disorder (Mulvey et al., 2010) as measured by the Diagnostic and Statistical Manual of Mental Disorders (4th ed., text rev.; *DSM-IV-TR*; American Psychiatric Association, 2000). Approximately 30% of the sample also used two or more substances concurrently within six months of arrest. Unlike youth in the justice system, adolescents in the general community between 12 and 17 years of age engage in less frequent and severe SU. According to a U.S. national survey on SU by the Substance Abuse and Mental Health Services Administration (2011), only 10% of youth reported using illicit substances one month prior to participation in the study, with approximately 7% meeting criteria for SA or dependence and 4.5% meeting criteria for alcohol abuse or dependence.

Substance use, antisocial behaviour, and crime. This high rate of SU has direct implications for the juvenile justice system, particularly in terms of increased risk for delinquency, antisocial behaviour, and recidivism (D'Amico, Edelen, Miles, & Morral, 2008; Hicks, Schalet, Malone, Iacono, & McGue, 2011; Yessine & Bonta, 2012) as well as reduced compliance and completion of drug rehabilitation (Stein, Deberard, & Homan, 2013). A recent Canadian governmental report found that adolescent high risk offending trajectories characterized by high and stable recidivism rates across life were related to more severe and frequent SA problems as measured by probation officers compared to offenders who displayed stable low offending patterns (Yessine & Bonta, 2012).

Another recent study examining high risk adolescent Dutch offenders given court mandated treatment isolated separate risk profiles for different types of offenders (Mulder, Vermunt, Brand, Bullens, & van Marle, 2012). Low frequency serious violent offenders who were charged with crimes such as aggravated assault, manslaughter, arson, and murder reported high SU rates compared to sex offenders and property offenders. Similarly, the highest risk offenders who were categorized as violent property offenders and committed assault, robbery, and theft with high frequency had the highest rates of SA before and during the commission of crime and had the highest prevalence of alcohol abuse of any group.

Consistent with the relationship between alcohol and high risk and frequency offending found by Mulder et al. (2012), research has found that alcohol use is a major risk factor for offending and violence. In a study examining the effects of different substances on recidivism in detained juvenile offenders from southern Australia, Putnins (2003) found that general reoffending after a six month follow up was related to self-

reported alcohol ($r = .23$) and inhalant use ($r = .21$) one month before initial incarceration. Putnins (2003) speculated this was because of the disinhibiting effects of each drug as central nervous system depressants. While the magnitude of the effect size was not particularly strong, because many offenders use alcohol (40% within six months of offending; Mulvey et al., 2010), this relationship is particularly concerning for the juvenile justice system.

Apart from general recidivism rates, there appears to be a direct link between alcohol and aggression in youth, particularly for severe binge drinking and violence (Fergusson & Horwood, 2000; Marcus & Jamison, 2013; Swahn & Donovan, 2006). This relationship also appears to be stronger in African-American and Hispanic youth than Caucasian youth (Swahn & Donovan, 2006). In terms of specific offense types, alcohol use was found to be related to sexual assault and assault against strangers (Felson, Burchfield, & Teasdale, 2007). Furthermore, a causal relationship may exist between alcohol intoxication and violence. Investigating a sample of high school students from the U.S., Felson, Teasdale, and Burchfield (2008) found that adolescents who reported drinking alcohol were at increased risk to fight when severity and frequency of alcohol use increased than when sober. While students classified as drinkers engaged in more fights than those who did not drink even when they were sober, the frequency of fighting within drinkers as a group increased as they consumed alcohol, suggesting a possible causal relationship between the two factors.

Another recent study investigating juveniles from the PYS noted similar findings. White, Fite, Pardini, Mun, and Loeber (2013) found that increases in alcohol consumption above an individual's average/normal levels of drinking were associated

with increases in aggressive behaviour, especially for boys who held more positive views of violence and lived in neighbourhoods characterized by high-crime rates. This also appears to be the case with violent crime. Recent research examining a New Zealand cohort assessed from birth up to age 16 suggested that a causal relationship existed between the number of alcohol abuse and dependence symptoms and measured by the *DSM-IV* (American Psychiatric Association, 2000) and reactive crimes such as assault, violence, and property based offenses like vandalism and arson (Boden, Fergusson, & Horwood, 2012).

Research has also closely examined the relationship between violence and marijuana, the most widely used substance by juvenile offenders according to urinalysis (Dembo, Belenko, Childs, Greenbaum, & Wareham, 2010) and self-report (Mulvey et al., 2010). While most research has identified a positive relationship between cannabis and violence, especially during early adolescence (Brady, Tschann, Pasch, Flores, & Ozer, 2008; Haus, Hassler, & Choquet, 2008; White, Loeber, Stouthamer-Loeber, & Farrington, 1999), other studies have challenged the direct relationship between the two factors (Marcus & Jamison, 2013; Putnins, 2003; Wei, Loeber, & White, 2004).

In support of the relationship, White et al. (1999) found that frequency of marijuana use at age 13 was related to increased violence at ages 14 through 18, even after controlling for other factors such as involvement in property crime, low school achievement, ADHD symptoms, and frequent sexual intercourse. Furthermore, even after age, gender, and tobacco and alcohol use are controlled for, youth who had engaged in marijuana at least once in their lives were found to be at an increased risk for violence compared to those who never used cannabis (Haus et al., 2008). This appears to be

particularly true of early marijuana use. Brady et al. (2008) found that Mexican-American and European-American youth who reported using marijuana before age 15 were at increased risk to commit a violent act by age 18, whereas late onset of marijuana use was not predictive of violence during young adulthood. Even in studies where the relationship between marijuana and violence was moderated by other factors (i.e., ethnicity or poly drug use) early onset of marijuana use was still found to be a risk factor for violence (Wei et al., 2004), signifying the importance of early SU onset as a risk factor for delinquency.

One hypothesis contends that individuals who begin to use drugs and alcohol at an earlier age, especially before age 12 (White et al., 1999), are a higher risk group than youth who begin to use substances later in adolescents. Whereas alcohol and marijuana use becomes more normative as adolescents age, it is possible that early use is associated with a more atypical trajectory involving antisocial peers and other early behaviour problems not always found in juveniles who begin to use substances later in life. Research investigating the developmental pathways to early onset SU supports this theory. Externalizing disorders such as ODD and CD may cause boys and girls to reject prosocial peers and institutions (i.e., school) and move towards antisocial youth who encourage early SU (Colder et al., 2013; Dodge et al., 2009). While youth typically use substances later in adolescence to self-medicate in response to internalizing disorders (Hussong, Jones, Stein, Baucom, & Boeding, 2011), research has also noted that internalizing disorders can buffer against early SU by increasing social withdrawal and protecting against associations with antisocial peers (Colder et al., 2013; Fite, Colder, & O'Connor, 2006). While there is research challenging this hypothesis (i.e., Marcus &

Jamison, 2013), early SU onset has still has been identified as a robust risk factor for antisocial behaviour beyond marijuana use.

Ellickson and McGuigan (2000) found that frequency of alcohol, marijuana, and tobacco use in grade seven children from the U.S. was predictive of self-reported violence five years after follow up during the senior high school year. Early drug use significantly predicted using force to obtain money or things from others, involvement in gang fights, carrying a hidden weapon, and assaulting someone with the intent to injure or maim. Similarly, research investigating Dominican youth in the north-eastern U.S. found that age of initiation of alcohol and marijuana use was predictive of future violent behaviour, including carrying a weapon (Reid, Garcia-Reid, Klein, & McDougall, 2008).

Early SU onset is not just related to violence, but offending and antisocial behaviour in general. Examining 14 to 18 year old adolescents who were admitted into an outpatient SA clinic, Gordon and colleagues (2004) noted that juveniles who began using drugs at an earlier age were more likely to begin offending from an earlier age than those without a SU problem or who began using drugs later in life. Gordon et al. also found that early onset of SU was significantly positively correlated with delinquency, severity of crime, lifetime arrests, aggressive and violent behaviour, bullying, and cruelty to humans and animals. A subsequent study by Odgers and colleagues (2008) also found that early SU onset before age 15 in boys and girls was related to adult criminal convictions and substance dependence at age 32 independent of comorbid childhood CD. This evidence suggests that early detection and treatment of SA in adolescence can be particularly important as primary preventive measure against future antisocial behaviour.

Effective treatments to reduce recidivism should also consider the age at which SU first began in addition to the severity and frequency of SU.

While Moffitt (1993) outlined that SA was associated with adolescent-limited offending trajectories (i.e., not adult-persistent), most research has found that juvenile SA is related to stable, long term risk patterns that can persist into adulthood. In a longitudinal study investigating the annual rate of offending in adolescents from the U.S. from 14 to 23 years of age, Murphy et al. (2012) found that youth who showed the highest and most persistent crime rates from adolescence to young adulthood had earlier onsets of alcohol, marijuana, and other drug use and the highest lifetime alcohol use frequencies for both males and females when compared to lower risk trajectory groups.

These results provide evidence that frequency and severity of substance use during adolescence can predict long term risk outcomes into adulthood, particularly for early alcohol and marijuana use. Such findings help reinforce the importance of targeting SU and concurrent antisocial behaviour in the juvenile justice system as a means to deter longitudinal offending patterns. However, risk assessment and treatment directions involving offenders with SU problems can still be improved. Research investigating how SU interacts with other risk factors can help form a more integrative approach to assessment and treatment of juvenile offenders. One promising and novel field of research in this area involves examining the relationship between SU and psychopathy in adolescent offenders.

Substance use and psychopathy. SU and adolescent psychopathy are associated with many similar constructs, including internalizing disorders such as anxiety and depression (Kubak & Salekin, 2009; Neighbors, Kempton, & Forehand, 1992; Price et

al., 2012) as well as behaviour problems, violence, and long-term offending trajectories. Therefore it should not be surprising that the two factors are associated in both adult (Wallinius et al., 2012) and juvenile offender populations (Campbell, Porter, & Santor, 2004; Corrado, Vincent, Hart, & Cohen, 2004; Kimonis, Tatar, & Cauffman, 2012; Mailloux, Forth, & Kroner, 1997; O'Neil et al., 2003; Vaughn, Edens, Howard, & Smith, 2009).

In one of the first studies to investigate SU and psychopathy in a small sample of adolescent offenders, Mailloux and colleagues (1997) found that illicit drug ($r=.45$) and alcohol use ($r=.41$) was related to the behavioural characteristics of psychopathy as measured by a version of the PCL-R adapted for use with youth. This was particularly true of the impulsive lifestyle features. Furthermore, the brief report outlined that two risk factors for adolescent offending, an earlier age of SU onset and poly drug use, were associated with increased psychopathy in youth. A subsequent study investigating age of onset of illicit drug use in a sample of high risk incarcerated boys found comparable results (Corrado et al., 2004). Using the two factor model, age of drug use onset negatively correlated with PCL:YV total ($r= -.20$) and Factor 2 ($r= -.25$) scores, while the relationship between early SU and the behavioural facet of the three-factor model approached significance ($r= -.17$). While a similar study found that early alcohol use was related to total PCL:YV scores independent of gender, the relationship was not significant when four of the five items representing antisocial Factor 2 traits were removed (Campbell et al., 2004). Such results indicate that Factor 2 traits are especially important in understanding the relationship between psychopathy and SU in juveniles.

Longitudinal studies have also noted the importance of the behavioural and antisocial psychopathic traits in relation to SU (Loney, Taylor, Butler, & Iacono, 2007). Loney and colleagues investigated the ability of multiple externalizing disorders to predict psychopathy in boys as measured by the Minnesota Temperament Inventory (MTI) over a six year follow up. Severity of alcohol, nicotine, and marijuana dependence was measured using clinical interviews. Loney et al. found that severity of alcohol, nicotine, and marijuana dependence was predictive of antisocial psychopathic traits during intake at age 17 after controlling for CD, ADHD, and ODD. Nicotine accounted for the most variance in psychopathy scores, uniquely explaining 6.25% of the variance in the antisocial factor while alcohol accounted for 4%. Even 6 years later in adulthood, psychopathy was predicted by alcohol ($sr^2 = .017$) and nicotine dependence ($sr^2 = .040$), even though magnitudes of association were smaller for each substance than at intake.

Other research has found that the Factor 1 components of psychopathy are also related to SU in youth. Murrie and Cornell (2000) found that self-reported SU proneness was positively related with total, Factor 1, and Factor 2 PCL-R scores in adolescents admitted into a state psychiatric facility. Most interestingly, youth who scored in the highest third of all participants on the PCL-R ($M > 22$) also scored significantly higher on SU than those who scored in the lowest third ($M < 10$; $\eta^2 = 30.50$) independent of gender. In another study investigating a high risk sample of adolescent males sentenced to a court mandated SA program, O'Neil et al. (2003) found that frequency of SU as measured by urinalysis testing was related to total, Factor 1, and Factor 2 PCL:YV scores. One study even found that core personality features related to psychopathy, instrumental planning and lack of empathy, showed a direct relationship with SU proneness to the exclusion of

behavioural characteristics, namely emotional reactivity, in a sample of highly violent boys and girls (Loper, Hoffschmidt, & Ash, 2001).

While most research has focused on the PCL:YV to investigate the relationship between psychopathy and SU, recent research has started to examine the relationship with self-report measures of psychopathy, particularly the APSD and YPI. In one of the only studies to investigate SA and the YPI and ASPD concurrently, Poythress et al. (2006) found that total APSD ($r = .24$) and YPI scores ($r = .20$) correlated with SU severity within the past year in a sample of adolescent offenders diverted into treatment. Drug severity was measured by the severity of substance used. Hard illicit drug use was classified as the most severe drug use, followed by marijuana, alcohol, and tobacco use. When the factor scores of each measure were examined, only impulsive traits were predictive of SU. No gender differences were found. Similarly, a recent study investigating the APSD CU factor found that CU traits did not uniquely predict long-term SU after CD was controlled for in the regression model (Wymbs et al., 2012).

Additional research investigating the YPI has found a positive relationship between impulsive traits and SU. Using a sample of rural Dutch high school students, Hillege, Das, and de Ruiter (2010) compared the YPI to self-report screening measures of alcohol use frequency and illicit drug disorder symptoms. In boys, Hillege et al. (2010) found that YPI total and factor scores were related to drug disorder symptoms ($r_s = .17-.21$) and alcohol use ($r_s = .18-.28$). Of all SU measures, alcohol frequency was most strongly related to the impulsive/behavioural traits for both girls and boys. Another study investigating the YPI and hard (i.e., cocaine, ecstasy, heroin, etc.) and soft (i.e., marijuana and hashish) drug use in Dutch adolescents enrolled in a residential treatment

program for severe behaviour problems revealed similar results (Nijhof et al., 2011). In boys, soft drug use was associated with all YPI factors ($r = .35$ - $.45$), with impulsive traits showing the strongest effect size, while hard drug use significantly correlated with only Impulsive-Irresponsible scores ($r = .32$). In girls, soft drug use was only related to impulsive traits ($r = .35$) while hard drug use was related to Impulsive-Irresponsible scores ($r = .23$) and CU features ($r = .22$).

In general, research investigating SU and the YPI and APSD in adolescents suggests that self-report measures of psychopathy, especially the impulsive dimension, can accurately predict various SU outcomes in boys and girls. The consistency of the relationship between the behavioural aspects of psychopathy and SU may be due to the association between Factor 2 traits and increased emotional reactivity in conjunction with internalizing disorders such as anxiety. Research investigating the relationship between psychopathic traits and anxiety in court recruited adolescent offenders found that impulsive traits as measured by the APSD were related to self-reported symptoms of generalized anxiety disorder ($r = .41$) while CU traits were unrelated ($r = .01$; Kubak & Salekin, 2009). Aggregated post-traumatic stress disorder (PTSD) and separation anxiety symptoms were also related to impulsive traits ($r = .49$) but not CU traits ($r = .09$).

When psychopathy is examined as two distinct primary and secondary variants in adolescents, research provides further support for the relationship with anxiety and reactivity. Karpman (1955) typified primary variants by a lack of emotion and anxiety while secondary variants were said to be emotionally reactive and anxious. More recent research with adults noted that primary psychopaths displayed higher Factor 1 traits with moderate degrees of Factor 2 traits and anxiety, whereas secondary types had higher

anxiety and expression of behavioural traits (Swogger & Kosson, 2007; Vassileva, Kosson, Abramowitz, & Conrod, 2005). While some studies have not found differences in psychopathic traits between primary and secondary variants in adolescents (Kimonis et al., 2011), other research has. Kimonis et al. (2012) found that male adolescent secondary variants displayed higher YPI Impulsive-Irresponsible scores and showed increased physical anxiety, increased worry, and social concern than primary variants in a sample of U.S. high risk adolescent male offenders from 14 to 17 years of age. Investigating a comparable sample, Lee and Salekin (2010) identified secondary variants as having fewer psychopathic personality features and higher anxiety than primary variants.

Given the unique relationship with anxiety, emotional reactivity, and impulsive traits, it is not surprising that research has found that secondary psychopathy is predictive of SU above primary psychopathy. Kimonis and colleagues (2012) found that youth classified within the secondary subtype had the highest rates of SU frequency six months prior to incarceration, had higher rates of alcohol use ($d = .38$), and were over four times as likely to have a SU disorder compared to primary variants. Secondary variants were more likely to meet diagnostic criteria for *DSM-IV* alcohol abuse, alcohol dependence, or drug dependence (American Psychiatric Association, 2000). Most importantly, Kimonis et al. (2012) found that among youth scoring high in psychopathy, offenders who showed distinct high anxiety and impulsivity profiles had more past and present substance related problems in terms of severity and frequency.

Other studies investigating primary and secondary variants have identified similar results. Vaughn et al. (2009) found that adolescent offenders high in APSD rated psychopathic traits classified as secondary variants displayed higher rates of overall SU

the year prior to arrest than primary variants. Additionally, Wareham, Dembo, Poythress, Childs, and Schmeidler (2009) found that a group of adolescent offenders characterized as high impulsive-anxiety had the highest levels of SU one year prior to arrest and had higher frequency of use than the psychopathy-like primary variant. These differences were not detected with the impulsive-low anxiety group, providing further evidence that the emotional reactivity associated with the behavioural features of psychopathy may be particularly salient in SU behaviour.

Together, these findings suggest that that the behavioural/impulsive psychopathic traits associated with increased reactivity and anxiety are the most salient psychopathic traits in predicting SU outcomes, especially increased frequency and severity. However, many research questions still remain unanswered. Specifically, no published studies have investigated the nature of the psychopathy-SU relationship across varying levels of criminal risk within a single sample and if other SU outcomes besides severity and frequency of use can be predicted using psychopathy self-report measures. Furthermore, little research has investigated how specific substances, such as alcohol, interact with psychopathic traits to affect criminal risk outcomes, most notably violence.

Nevertheless, the current literature supports the relationship between SU and psychopathy as a risk factor in the criminal justice system. This, however, does not mean that all juvenile offenders with psychopathic traits and/or SU problems will continue offending with adult persistent crime patterns. Responsivity factors exist that help mitigate risk while increasing resilience and treatment amenability in youth. Of particular interest for the juvenile justice system is understanding how these factors interact with

risk in order to improve treatment and reduce recidivism. One important responsivity factor related to SU and psychopathy is motivation to change criminal behaviour.

Motivation to Change Criminal Behaviour

Motivation as a responsivity factor with juvenile offenders. With juvenile offenders, an increased motivation to change problem behaviour and seek treatment has been identified as an important responsivity factor related to increased treatment amenability and completion as well as reduced risk for offending (Abrams, 2012; Salekin et al., 2001; Salekin et al., 2002). Unlike protective factors which act to buffer against antisocial behaviour and encourage resiliency (i.e., prosocial peers, positive family dynamic; Redmond et al., 2009), responsivity factors are related to improved treatment engagement and outcomes which can help reduce the likelihood of recidivism (Andrews, Bonta, & Hoge, 1990). According to the responsivity principle of the Risk-Need-Responsivity model (RNR; Andrews et al., 1990), rehabilitation is most effective when treatment incorporates general and specific responsivity factors. General responsivity refers to the therapeutic relationship and style of therapy that is most effective (i.e., structured, cognitive behavioural therapy) while specific responsivity involves tailoring treatment to individual characteristics that can increase the effectiveness of rehabilitation, such as offender education, learning style, strengths, personality, and motivation to change (Andrews & Bonta, 2010). In terms of motivation, treatment programs need to be cognizant of each individual's intrinsic desire to change. When motivation to change is low, it is important that clinicians and correctional staff work with offenders to increase motivation to participate in treatment in order to increase the likelihood of successful rehabilitation.

Similarly, the Transtheoretical Model of Change (TTM; Prochaska & DiClemente, 1982) incorporates motivation as a dynamic factor related to stages of change and treatment amenability. In terms of TTM stages of change, most adolescent offenders are in the Precontemplation Stage and do not acknowledge that their behaviour is problematic (Hemphill & Howell, 2000) and only cite external motivations for treatment (i.e., they are forced into treatment; Davis, 2000) which is not strongly related to treatment success (Breda & Heflinger, 2004). However, progress from the Contemplation Stage into the Preparation and Action Stages is marked by increases in understanding of problematic behaviour and intrinsic motivation to change. Correspondingly, this increase in awareness and desire to change is marked by treatment improvements, particularly with conventional correctional programming (Willoughby, Perry, & Vandergoot, 2003).

These principles of responsivity and stages of change have shaped the opinions of both psychologists and judges in the juvenile justice system. Research investigating ratings of treatment amenability in young offenders by psychologists from the Clinical Child Psychology Division of the American Psychological Association, found that motivation to engage in treatment was rated as the most important factor in determining amenability to treatment (Salekin et al., 2001). Psychologists also consistently identified youth who displayed increased motivation to pursue treatment and change problem behaviour as offenders who would best respond to the rehabilitative approach of the juvenile justice system in the U.S. In a follow up study examining judges from the National Council of Juvenile and Family Court Judges, Salekin and colleagues (2002) found that low motivation to change was rated as the most important treatment

amenability related construct in decisions to send young offenders to adult court. Because adult court transfer is designed for youth who are deemed to be at increased risk for adult persistent crime, these studies suggest that motivation to change is associated with improved treatment outcome and reduced risk for future crime, at least from the perspective of psychologists and court justices.

A recent study investigating youth who had been charged with a felony offense or were repeat offenders corroborated the importance of motivation to change outlined by psychologists, judges, the TTM, and the RNR model (Abrams, 2012). Using data gathered from open-ended qualitative interviews with adolescents, Abrams found that youth classified as having low motivation to change criminal behaviour focused on personal consequences of crime and a fear of being caught for future criminal offenses. These individuals were candid in their belief of not wanting to change their criminal lifestyle upon release. In contrast, those offenders who were categorized as having a high motivation to change cited a desire to change to avoid victimizing others and an increased interest to complete treatment. One of the biggest differences between groups was the cognitive strategies used to prepare for success upon release. While those who had a low motivation to change disregarded potential problems upon release, those who had moderate to high degrees of motivation understood challenges would occur and that preparation was needed to avoid relapsing into criminal lifestyles. These offenders thought of ways to control impulsivity, find socially acceptable ways to deal with problems, and plan possible exit strategies when placed in high risk situations as they were taught during treatment.

In general, Abrams (2012) noted that an increased motivation to change was associated with an increased efficacy to generate prosocial alternatives to crime and increased engagement and compliance with treatment. However, the study did not investigate recidivism or long term offending outcomes after release or how risk level affected differences between motivational groups. Because a qualitative design was used, Abrams also could not quantify the effect of motivation on improving cognitive strategies to avoid crime. Consequently, it is not known if these differences were statistically significant or related to desistence of crime post-release. Nevertheless, motivation to change has been identified as an important responsivity factor with adolescent offenders displaying psychopathic traits and SU problems.

Motivation to change and psychopathy. Recent research by Salekin, Lee, et al. (2010) was one of the first published studies to examine the direct effects of psychopathy and motivation to change on predicting criminal risk, specifically three year violent recidivism rates. Psychopathy was measured using the CPS and motivation to change was assessed using the Motivation to Change subscale of the Risk-Sophistication-Treatment Inventory (RSTI; Salekin, 2004), a semi-structured clinical interview designed to assess core components of risk for offending, sophistication-maturity, and treatment amenability in juvenile offenders.

The Motivation to Change subscale is one of three components of the RSTI Treatment Amenability scale and measures the extent to which an individual is open to and expects change as well how intrinsically motivated they are to engage in treatment. Research has found that the inter-rater reliability of the Treatment Amenability scale is good (ICC= .91) and is related to positive interactions with prison staff, maintenance of

appropriate boundaries, and reduced CD symptoms in boys (Leistico & Salekin, 2003) and is related to the violence protection subscale of the Structured Assessment of Violence Risk in Youth (SAVRY; Borum, Bartel, & Forth, 2006) in boys and girls (Spice, Viljoen, Gretton, & Roesch, 2010). Interestingly, Jordan (2008) also found that the Contemplation and Action stages of the TTM, stages most closely associated with intrinsic motivation, were moderately correlated with total RSTI Treatment Amenability scores in boys and girls, while the Precontemplation Stage was negatively related.

Using a hierarchical linear regression, Salekin, Lee, et al. (2010) found that total CPS scores and Motivation to Change scores significantly predicted violent recidivism in the first step of the regression. In terms of main effects, increased psychopathy was predictive of criminality while high motivation to change was predictive of reduced offending. The two-way interaction term between psychopathy and motivation to change also approached significance in predicting violent recidivism after controlling for the main effects of psychopathy and motivation in step one ($p < .06$). Analysis of simple slopes revealed that in youth with fewer psychopathic traits, motivation to change did not affect violent recidivism. However, in youth with many psychopathic traits, having low motivation to change was associated with increased violence compared to when motivation was high. Furthermore, youth who scored high on the CPS and low in motivation also reoffended sooner upon release than the other three psychopathy-motivation groups. In this sense, adolescent psychopathy was only indicative of high rates of future criminal activity when youth also had little motivation to change.

From a criminal justice perspective, the results reported by Salekin, Lee, et al. (2010) suggest that responsivity factors exist in high risk populations such as youth with

psychopathic traits and that these factors can help reduce violent recidivism after release. Concurrently, the absence of these factors is associated with increased violence. The study also provided a foundation from which to investigate the efficacy of motivational based interventions in youth with psychopathic traits. Even though earlier studies speculated that motivation may have been a confounding variable in explaining improvement in psychopathy focused treatments (Gretton et al., 2001), not until recently has research investigated the effect of motivational based interventions in youth with psychopathic traits.

Investigating a similar sample, Salekin, Tippey, and Allen (2012) assessed the efficacy of a mental model intervention to increase motivation for treatment while decreasing the level of psychopathic traits in juvenile offenders with comorbid CD and interpersonal callous traits. The intervention was administered in a group setting over 12 weeks in a secure residential treatment centre. The treatment consisted of a motivational based component which emphasized the importance of treatment completion for success and a component which aimed to increase positive emotion by helping youth focus on their strengths and improve positive interactions with others. Lastly, trained facilitators helped offenders mentally visualize how to plan and set goals as well as improve decision making. Psychopathy was measured with the APSD while treatment amenability, including motivation to change, was assessed with the RSTI- Self-Report (RSTI-SR; Iselin & Salekin, 2008) which has an identical factor structure to the RSTI.

Progress was assessed at three separate times during the 12 weeks of treatment, once at baseline/pre-treatment, midway through treatment, and when treatment was completed. In terms of psychopathy, Salekin, Tippey, et al. (2012) found that total,

interpersonal, affective, and impulsive traits decreased throughout treatment, with interpersonal traits showing the greatest decreases similar to findings from other psychopathy treatment studies (i.e., Caldwell et al., 2012). Treatment was also associated with moderate improvements in all three RSTI-SR treatment amenability scales, including motivation to change ($d = .49$), and increases in positive emotion and decreases in risk.

A similar study investigating a different brief motivational based intervention found comparable results with adolescent offenders with CD and psychopathic traits (Salekin, Lester, & Sellers, 2012). Youth were randomly assigned to either a treatment or control group in which they received a PowerPoint presentation which outlined that intelligence/cognition is plastic and increases with age (treatment) or that intelligence is inflexible and largely based on genetic factors (control). The treatment group differed from control in that it acted as a brief intervention designed to motivate youth that cognitive change was possible. Interestingly, youth who received the treatment presentation showed increased motivation as measured by the RSTI-SR and interest in participating in a problem solving task than those who were informed that intelligence is rigid. In terms of treatment, Salekin, Lester, et al. (2012) concluded that brief interventions that increase motivation can increase compliance and enthusiasm to complete tasks. Considering youth with psychopathic traits often show poor treatment compliance and completion (Falkenbach et al., 2003; O'Neil et al., 2003), effective interventions that increase enthusiasm could be important in helping reduce recidivism and violence in youth with psychopathic traits. Similarly, research has also found that motivation is important in understanding and treating youth with SU problems.

Motivation to change and substance use. Research has found that intrinsic or internal motivation to change is important for initial engagement and completion of SA treatment programs (DiClemente, Garay, & Gemmell, 2008). Compared to adults, adolescents are less intrinsically motivated to change SU behaviour and are less likely to complete SA treatment programs that can help reduce antisocial behaviour (Breda & Heflinger, 2004; Clair et al., 2011; Melnick, De Leon, Hawke, Jainchill, & Kressel, 1997; Wisdom et al., 2011). This is especially true of youth involved in the juvenile justice system who are normally only given external motivators of change (i.e., court mandated SA treatment; Melnick et al., 1997). These youth are usually forced to comply and may not have any internal motivation to change. Unlike intrinsic motivation, research has found that external motivation is unrelated to improved treatment outcome (Breda & Heflinger, 2004).

Of further concern for the juvenile justice system is that common externalizing disorders within juvenile corrections, such as ADHD, ODD, and CD, are also related to decreases in intrinsic motivation to change SU problems (Austin, Hospital, Wagner, & Morris, 2010). However, most studies have found that motivation to change increases in youth as the severity of SU and its associated consequences increase (Austin et al., 2010; Breda & Heflinger, 2004; Slesnick et al., 2009) and when the number of internalizing symptoms, particularly depressive symptoms, increase (Battjes, Gordon, O'Grady, Kinlock, & Carswell, 2003). Recent research has also identified that childhood maltreatment, particularly emotional abuse and associated shame, is related to increased treatment engagement and motivation to change, as well as increased awareness of SU

related problems, possibly because of concurrent anxiety or depressive symptoms (Slesnick et al., 2009).

Nevertheless, research investigating adolescent offenders with SU problems has found that motivational interventions can increase motivation to change in youth and improve SU treatment responses. This is especially true of Motivational Interviewing (MI), a person-centred therapy designed to increase intrinsic motivation to change alcohol and other drug use while helping individuals establish goals that can facilitate change (Miller & Rollnick, 2002). This is largely accomplished by allowing adolescents to verbally reflect and create their own reasons for wanting change while providing a non-judgemental and empathic therapeutic setting. Research has found that MI is especially useful in reducing treatment resistance and SU and its associated consequences, especially in youth with heavier SU and reduced motivation to change (Miller & Rollnick, 2002; O'Leary-Tevyaw & Monti, 2004). MI can be especially ideal in correctional environments because of its effectiveness with oppositional individuals (Marlatt & Witkiewitz, 2002) and those with hostility (Waldron, Slesnick, Brody, Turner, & Peterson, 2001).

The efficacy of MI with young offenders with SU problems has more recently been examined. Stein and colleagues (2006) assessed the efficacy of MI in juvenile offenders using a treatment-control experimental design, where offenders who had reported previous alcohol or marijuana use were randomly assigned to one of two pre-SA treatment groups consisting of MI or a meditation focused relaxation therapy (RT). Engagement in treatment was measured at two separate times at baseline and two months after treatment using the Treatment Participation Questionnaire (TPQ; Stein et al., 2004).

Compared to RT control, adolescents who received MI before the standardized therapy showed decreased negative SA treatment engagement as measured by the self-reported TPQ. Negative engagement can be defined as problematic and delinquent behaviour during therapy (i.e., positive references towards drug use; Gifford-Smith, Dodge, Dishion, & McCord, 2005) that hinders the efficacy of rehabilitation.

However, Stein et al. (2006) did not examine if decreased negative SA treatment engagement and participation were related to improvements after release from detention. A more recent study investigating a similar sample of incarcerated young offenders found that increases in motivation to change alcohol use were related to positive treatment outcomes three months after release from detention (Clair et al., 2011). Not only did motivation predict improved positive engagement (i.e., discussion of the costs of drug use) and reduced negative engagement during treatment, but motivation to change was related to decreased frequency and quantity of alcohol use after controlling for initial use before treatment. Motivation, however, was not related to reduced severity of alcohol use after release. A recent brief report by Stein et al. (2011) extended these findings to MI and marijuana use. Using comparable methodologies as Stein et al. (2006), Stein et al. (2011) found that a combined MI-SU treatment was better than control RT at reducing risk related to marijuana use, including missing fewer school days and improving peer and familial relationships three months after release from detention.

Similar to psychopathy, interventions designed to increase motivation were found to improve treatment compliance and reduce risk after release in youth with SA problems. In terms of psychopathy, motivational based treatments helped reduce the expression of psychopathic traits as well risk for future offending whereas MI and SA

treatment reduced the frequency and quantity of SU in adolescent offenders as well as problem behaviours associated with drug use. In both cases, motivation acted as a responsibility factor in adolescents with SA problems and psychopathic traits. However, no published study has investigated how motivation to change moderates risk in adolescent offenders with comorbid psychopathic traits and SA problems.

The Current Study

Purpose of the study. The overall goal of the study was to investigate if psychopathy, SU, and motivation to change can be integrated in the juvenile justice system in order to improve risk assessment and treatment implications. In this regard, the current study had two central purposes. The first was to clarify the nature of the relationship between psychopathy and SU in adolescent offenders and the second was to examine the three-way interaction between psychopathic traits, SU, and motivation to change in predicting risk for offending. Three separate research questions related to the psychopathy-SU relationship were examined.

Firstly, this study investigated how SU severity, frequency of use, and age of onset were related to different self-report measures of psychopathy, the APSD and Youth Psychopathic Traits Inventory- Short Version (YPI-S; van Baardewijk et al., 2010). Severity of SU and age of onset were measured with the CRAFFT adolescent substance use screening measure (Knight et al., 1999) while frequency of SU was measured from the Self-Report Delinquency scale (SRD; Elliott, Huizinga, & Ageton, 1985). The current study is one of the few studies that allows for a direct comparison between two different psychopathy measures in their ability to predict multiple SU outcomes.

Furthermore, this study examined the relationship between psychopathy and SU at high and low levels of criminal risk. Most research investigating psychopathy and SU to date has used high risk adolescent offender samples (see Kimonis et al., 2012) and when lower risk youth were assessed, they were from the general school aged population. As such, no study to date has investigated how risk is related to the relationship between psychopathy and SU within juvenile offender samples, particularly lower risk offenders. Risk was assessed using the Risk of Offending scale of the condensed interview version of the RSTI, the RSTI-Abbreviated (RSTI-A; Salekin, 2012).

Lastly, the relationship between psychopathy and severity of alcohol dependence symptoms was examined using the Alcohol Dependence Scale (ADS; Skinner & Allen, 1982). Alcohol is particularly salient because of its association with adolescent and adult persistent offending trajectories (Murphy et al., 2012), just like psychopathic traits. Similarly, both alcohol use (Boden et al., 2012) and behavioural psychopathic traits (Flight & Forth, 2007) are related to reactive violence in youth. Because of their similarity in predicting reactive violence and long-term offending, this study investigated how alcohol severity of use interacts with the behavioural characteristics of psychopathy and reactive violence as measured by the Peer Conflict Scale (PCS; Marsee & Frick, 2007).

Even though motivation has been found to be a responsivity factor in youth with SU problems and psychopathic traits, this is the first study to investigate how motivation to change interacts with SU and psychopathy to predict risk in adolescent offenders. Motivation to change was assessed with the RSTI-A Motivation to Change subscale. Apart from examining the three-way interaction, the individual main effects of

psychopathy, SU, and motivation in predicting risk and all the two-way interactions were also calculated.

Hypotheses. The hypotheses are as follows. Based on studies investigating the relationship between self-reported psychopathic traits and SU (Kimonis et al., 2012; Nijhof et al., 2011; Poythress et al., 2006; Vaughn et al., 2009) it was expected that both YPI-S and APSD total and impulsive scores would positively correlate with CRAFFT severity of use scores, ADS severity of alcohol use, and SRD SU frequency scores while negatively correlating with age of SU onset. Secondly, it was hypothesized that this relationship would be significant with offenders categorized as high and low risk and in both boys and girls. It was also expected that total ADS scores would interact with impulsive psychopathy and PCS reactive violence scores. Specifically, it was expected that alcohol would display a synergistic effect with impulsive psychopathic traits in predicting reactive violence incrementally above the two main effects because of the strong association of each predictor with reactive violence.

For the analyses between psychopathy, SU, and motivation to change, it was expected that total self-reported psychopathy and all SU measures would predict increased RSTI-A Risk for Offending scores. Motivation to change was also expected to be related to decreased risk. Similar to findings from Salekin, Lee, et al. (2010), it was believed that the two-way interaction between motivation and psychopathy to predict risk would be significant; psychopathy would predict risk only when motivation to change is low. Similarly, only when motivation was low would SU severity and frequency predict increased risk, while an older age of SU onset was expected to be related to reduced risk only when motivation was high (Clair et al., 2011; Stein et al., 2011). Lastly, the three-

way interaction would be significant in predicting risk above the main effects and two-way interactions. High psychopathy scores would predict higher risk at high SU scores than at low SU scores and only when motivation is low.

Method

Participants

The sample consisted of 55 adolescent boys ($n=48$) and girls ($n=7$) recruited from a south eastern U.S. detention centre and court awaiting transfer or sentencing at time of participation. Each participant received \$15 for their participation. Participants ranged between 13 and 18 years of age ($M=16.18$, $SD=1.23$), with 44 (80.0%) identifying as African American, 10 (18.2%) as Caucasian, and one (1.8%) as biracial. Self-reported age of first offense ranged between two and 16 years of age ($M=11.69$, $SD=3.11$). While it is unlikely that offending can take place at age two as was reported, this response could reflect information that the participant obtained from collateral sources. Thirty-five participants had at least one violent offense (i.e., domestic violence, assault, robbery, homicide) while 48 reported at least one nonviolent offense (i.e., breaking and enter, disorderly conduct, drug charges, trespassing).

Each participant admitted to using alcohol or other drugs at least one time prior to arrest, with 47 reporting having used alcohol (85.5%), 52 (94.5%) using marijuana, and 16 (29.1%) using a substance other than marijuana not prescribed by a physician. Of these substances, the most commonly cited were pharmaceuticals, cocaine, and meth.

Measures

Risk-Sophistication-Treatment-Inventory- Abbreviated (RSTI-A; Salekin, 2012). The RSTI-A is composed of three 15 item scales which measure Risk for

Offending, Sophistication-Maturity, and Treatment Amenability. The clinical rating scale is identical to the RSTI (Salekin, 2004), except the interview used to assess each item contains fewer questions, reducing the interview length from 120 minutes to 50 minutes. Clinical raters score items using detailed criteria provided in item descriptors and each item score is based on a 3-point scale, with 0 denoting a complete absence of the ability or characteristic, 1 suggesting subclinical/ moderate characteristic/ability, and 2 denoting complete presence of the characteristic/ability. In the current study, only the Risk for Offending scale and Motivation to Change subscale were used. Risk is assessed based on offender violence (five items), instrumentality and extensiveness of offending (six items), and psychopathic traits (four items) while the Motivation to Change subscale measures the extent to which an individual is open to and expects change as well how intrinsically motivated they are to engage in treatment (five items).

Research investigating the original RSTI has found that the Risk for Offending scale showed convergent validity with the SAVRY in a Canadian offender sample of boys and girls (Spice, Viljoen, Gretton, & Roesch, 2010) and was related to an early age of antisocial onset, violent offending, and CD in boys (Leistico & Salekin, 2003). Research investigating the Treatment Amenability scale, of which Motivation to Change is a component, found that it was related to positive interactions with prison staff, increased protection from committing violence, and the Contemplation and Action stages of the TTM (Jordan, 2008; Leistico & Salekin, 2003; Spice et al., 2010). Based on ten randomly selected interviews scored by two trained graduate students, inter-rater reliability for the Risk for Offending (ICC=.88) and Treatment Amenability scales (ICC= .88) was good.

Internal consistency of the 15 Risk for Offending items was good ($\alpha = .79$) while the five Motivation to Change items were less consistent ($\alpha = .58$).

Antisocial Process Screening Device: Self- Report (APSD; Frick & Hare, 2001). The APSD is a 20-item self-report measure developed from teacher and parent rating scales used to assess psychopathic traits and antisocial behaviour in adolescents (see Appendix D). Each item is scored on a three-point scale (0 = *not at all true*, 1 = *sometimes true*, 2 = *definitely true*). While there has been research challenging the two factor model of the self-reported APSD (Bijttebier & Decoene, 2009; Poythress et al., 2006), there seems to be support for a three factor model as found in the teacher and parent rating scales when used to assess incarcerated adolescents (Vitacco et al., 2003). The three factors of the APSD are the Narcissism, CU, and Impulsivity factors which assess the interpersonal, affective, and behavioural characteristics of psychopathy, respectively.

The self-reported APSD has shown convergent validity with the parent report APSD and parental reports of delinquency and police contact (Muñoz & Frick, 2007). Furthermore, Sadeh et al. (2009) found that gender did not moderate the relationship between the APSD and its component factors with concurrent self-reported personality traits. While total APSD scores have shown good internal consistency over a two year follow-up ($\alpha = .78-.81$; Muñoz & Frick, 2007), recent evidence from Dillard et al. (2013) found that the internal reliability of the three factors is weaker than the parent rating version (α below .80), especially the CU subscale ($\alpha = .40$). While total scores displayed good internal consistency in the present study ($\alpha = .70$), alpha values for the Narcissism ($\alpha = .54$), CU ($\alpha = .61$), and Impulsivity ($\alpha = .55$) factors were weaker.

Youth Psychopathic Traits Inventory- Short Version (YPI-S; Van Baardewijk et al., 2010). The YPI-S is an 18-item self-report measure of psychopathic traits in adolescents modeled after the YPI (Andershed, Kerr, Stattin, & Levander, 2002). Research investigating the factor structure of the YPI-S has identified a three-factor structure which captures interpersonal, affective, and lifestyle traits (Colins, Noom, & Vanderplasschen, 2012; Van Baardewijk et al., 2010). Like the original YPI, these traits are part of the Grandiose-Manipulative, CU, and Impulsive-Irresponsible scales, respectively. Each item is scored on a four-point scale from “*does not apply at all*” to “*applies very well*”. Initial validation studies of the YPI-S found that the short version correlated very strongly with the original 50 item measure ($r = .95$; Van Baardewijk et al., 2010) and was structurally similar in both boys and girls. Colins, Noom, et al. (2012) found that the YPI-S also showed convergent validity with frequency of self-reported conduct problems and violent, drug, and property offenses for both boys and girls. Research examining the internal reliability of the three YPI-S factors has been mixed. van Baardewijk et al. (2010) found strong internal consistency for total and factor scores ($\alpha = .83- .85$), while Colins, Noom, et al. (2012) found alphas slightly below the conventional .70 cut off. In the current study total YPI-S scores showed strong internal reliability ($\alpha = .82$) and good consistency for the Grandiose-Manipulative ($\alpha = .69$), CU ($\alpha = .79$), and Impulsive-Irresponsible ($\alpha = .70$) factor scores.

Peer Conflict Scale (PCS; Marsee & Frick, 2007). The PCS is a 40-item self-report questionnaire designed to measure both physical (overt) and relational forms of reactive and proactive aggression in adolescents (see Appendix E). Reactive aggression is characterized as an aggressive response to threat or provocation while proactive

aggression is instrumental and unprovoked (Marsee et al., 2011). Items are scored on a four-point scale (0= *not at all true*, 1= *somewhat true*, 2= *very true*, and 3= *definitely true*). In the current study, combined overt and relational reactive scores were used to assess reactive violence accurately for both boys and girls. Research investigating incarcerated youth has found that each of the four PCS subscales (Reactive-Overt, Proactive-Overt, Reactive-Relational, and Proactive-Relational) displayed good internal consistency ($\alpha = .79- .89$) and that each subscale showed convergent validity with arrest history, CU traits, and delinquency (Marsee et al., 2011). Internal reliability for total reactive PCS scores was strong in the present study ($\alpha = .85$).

Self-Report of Delinquency (SRD; Elliot, et al., 1985). The SRD is a 46-item interview and self-report designed to measure the frequency in which juveniles (36 items) and their parents (10 items) engage in specific delinquent acts (i.e., robbery, theft, selling drugs/using drugs, fighting, weapons carrying, etc). The current study used a single item of an adapted version of the SRD as a self-report measure to assess the frequency of adolescent alcohol and drug use scored on a nine-point frequency scale from “*never*” to “*2-3 times per day*” (see Appendix F).

CRAFFT (Knight et al., 1999). The CRAFFT is a 6 question structured interview assessment designed to measure the extent and severity of SU problems in adolescents (see Appendix G). Each question is scored either as “yes” or “no”, with a higher proportion of “yes” responses indicating more severe substance abuse. The CRAFFT was modified to include preliminary questions to see if participants have ever used alcohol or other drugs and the age at which SU began. Research investigating the CRAFFT has found it to be a valid and reliable ($\alpha = .73$) brief screening measure of

alcohol and drug use in boys and girls (Knight, Sherritt, Harris, Gates, & Chang, 2003; Subramaniam, Cheok, Verma, Wong, & Chong, 2010). The internal consistency of the CRAFFT in this study was acceptable and similar to past research ($\alpha = .73$).

Alcohol Dependence Scale (ADS; Skinner & Allen, 1982). The ADS is a 25-item self-report measure that assesses the severity of alcohol dependence symptoms in both adults and older adolescents within the past 12 months. Total scores range from 0 to 47, with higher scores representing a higher level of alcohol dependence. Research investigating the ADS has found that it is a valid measure of problem alcohol use within high risk SA inpatient men and women (Kahler, Strong, Stuart, & Moore, 2003) as well as in incarcerated offenders from adolescence into late adulthood (Peters et al., 2000). In the current study, total ADS scores showed strong internal consistency ($\alpha = .89$).

Procedure

All procedures and measures were approved prior to data collection by the University of Alabama Institutional Review Board, Carleton University Ethics Board, and by the Tuscaloosa Juvenile Court and Detention Center. Participants were recruited prior to court hearings at the juvenile court and during visiting hours at the detention centre. Informed consent from one parent and juvenile assent were required before participants could begin the study (see Appendix A and B). After consent was obtained, participants completed a battery of self-reports and the RSTI-A and CRAFFT interviews. Interviews were conducted by trained graduate students and undergraduate research assistants. The order of administration of self-reports and interviews alternated between participants to avoid order effects, however order was not adjusted within the battery of

self-report measures. Upon completion, participants were given a debriefing form (see Appendix C).

The first 37 participants were administered self-reports using standardized survey software PsychoPy (Peirce, 2007) while the subsequent 18 participants completed paper and pencil versions of the measures in the same order. Prior to self-report administration, researchers ensured participants could read at a level appropriate for comprehending the battery. If participants had difficulty reading, researchers orally dictated questions and instructions to the participant. CRAFFT, RSTI-A and self-reports were completed in one session. One participant did not complete the APSD while another did not complete the CRAFFT. Four individuals did not complete the ADS even though they had consumed alcohol within the last 12 months. This was due to research assistant error when administering the battery. One participant did not complete the RSTI-A because they dropped out the study before the RSTI-A was administered. These individuals were excluded from analyses involving these measures.

Results

Descriptive Statistics, Intercorrelations, and Gender Differences

Participant APSD and YPI-S total and factor scores showed adequate variability around the mean and were normally distributed. Participants scored highest on the Impulsivity factor for the APSD and highest on the Grandiose-Manipulative factor of the YPI-S. Descriptive statistics for both psychopathy measures are displayed in Table 1. Intercorrelations between APSD and YPI-S total scores and concurrent factor scores were moderately to strongly correlated, with total scores correlating most strongly for both the APSD and YPI-S. Table 2 contains the intercorrelations between the two measures.

RSTI-A Risk for Offending and Motivation to Change scores were normally distributed, as were CRAFFT scores and age of SU onset. Self-reported SU frequency was significantly negatively skewed while ADS and total PCS reactive scores were positively skewed. The ADS score distribution was normalized after identifying and removing two outliers 4.87 and 3.47 SD away from the mean. Of those participants who completed the ADS, PCS reactive scores were normally distributed with no outliers. Because PCS reactive scores were only included in analyses with participants who completed the ADS, no transformation was needed to normalize the distribution. Descriptive statistics for each measure without outliers are found in Table 3.

Table 1

Descriptive Statistics and Internal Consistencies for APSD and YPI-S Total and Factor Scores

Measure	<i>M</i>	<i>SD</i>	Range	Alpha	Skew	Kurtosis
APSD Total	14.09	5.48	0-26	.70	.28	.10
Narcissism	3.81	2.49	0-10	.54	.41	-.513
Callous-Unemotional	4.31	2.52	0-10	.61	.60	-.21
Impulsivity	4.56	2.03	0-9	.55	.01	-.50
YPI-S Total	41.95	9.72	18-65	.82	-.08	-.30
GM	15.11	4.00	6-22	.69	-.18	-.58
Callous-Unemotional	12.31	4.38	6-24	.79	.47	-.16
II	14.53	4.08	6-24	.70	.16	-.19

Note. APSD= Antisocial Process Screening Device ($n= 54$); YPI-S= Youth Psychopathic Traits Inventory: Short Version ($N= 55$); GM= Grandiose-Manipulative; II= Impulsive-Irresponsible

Table 2

Intercorrelations between APSD and YPI-S Total and Factor Scores

Measure	1	2	3	4	5	6	7	8
1. APSD Total	—	.76**	.53**	.68**	.69**	.62**	.35*	.66**
2. APSD Narc		—	.09	.43**	.61**	.64**	.29*	.52**
3. APSD CU			—	.01	.40**	.25	.43**	.25
4. APSD Impul				—	.41**	.36**	.03	.58**
5. YPI-S Total					—	.83**	.79**	.72**
6. YPI-S GM						—	.53**	.42**
7. YPI-S CU							—	.29*
8. YPI-S II								—

Note. APSD= Antisocial Process Screening Device; Narc= Narcissism; CU= Callous-Unemotional; Impul= Impulsivity; YPI-S= Youth Psychopathic Traits Inventory: Short Version; GM= Grandiose-Manipulative; II= Impulsive-Irresponsible.

* $p < .05$, ** $p < .01$.

Intercorrelations between SU measures revealed that CRAFFT scores were significantly related to frequency of SU and ADS scores, however age of SU onset was not correlated with any SU outcomes. RSTI-A Risk for Offending was also moderately correlated with the CRAFFT and strongly related to PCS reactive violence scores and negatively associated with RSTI-A Motivation to Change scores. The intercorrelations between the RSTI-A Risk for Offending, RSTI-A Motivation to Change, PCS reactive violence and SU measures are displayed in Table 4.

A series of independent t -tests were conducted in order to assess if there were significant gender differences in the sample. Results revealed that boys scored significantly higher than girls on YPI-S total scores and on the CU factor but not the

Grandiose-Manipulative or Impulsive-Irresponsible factors. Differences between mean APSD total and factor scores, PCS reactive scores, and all SU and RSTI-A measures were not significant. However, boys scored higher on all measures than girls, except age of SU onset. While these differences were not significant, the mean gender differences in APSD, YPI-S, PCS reactive, CRAFFT, and SU frequency scores showed moderate to strong effect sizes. Descriptive and inferential statistics related to gender differences are found in Table 5.

Table 3

Descriptive Statistics and Internal Consistencies for PCS Reactive Total Scores, RSTI-A Risk for Offending and Motivation to Change Scores, and SU Measures

Measure	<i>M</i>	<i>SD</i>	Range	Alpha	Skew	Kurtosis
PCS Reactive Total	13.25	9.38	0-42	.85	.75	.06
RSTI-A Risk	18.24	4.61	7-28	.79	-.26	-.15
RSTI-A Motivation	6.30	2.13	2-10	.58	-.23	-.91
CRAFFT	3.50	1.71	0-6	.73	-.50	-.83
ADS	5.15	4.02	0-15	.89	.62	-.08
SRD Frequency of	6.62	2.82	1-9	--	-.91	-.65
SU						
Age of SU Onset	12.28	2.48	3-16	--	-.57	-.29

Note. SU= Substance Use; PCS= Peer Conflict Scale ($N= 55$); RSTI-A= Risk-Sophistication-Treatment Inventory- Abbreviated ($n= 54$); CRAFFT ($n= 54$); SRD= Self-report of Delinquency ($N= 55$); ADS= Alcohol Dependence Scale ($n= 41$); Age of SU Onset ($N= 55$).

Table 4

Intercorrelations between SU Measures, PCS Reactive Scores, and RSTI-A Risk for Offending and Motivation to Change Scores

Measure	1	2	3	4	5	6	7
1. CRAFFT	—	.62**	.35*	-.17	.18	.27*	.09
2. SU Frequency		—	.27	-.18	.09	.29*	-.26
3. ADS			—	-.04	.13	.30	-.16
4. Age of SU Onset				—	-.20	-.40**	-.03
5. PCS Reactive					—	.48**	-.02
6. RSTI-A Risk						—	-.36**
7. RSTI-A Motivation							—

Note. SU= Substance Use; ADS= Alcohol Dependence Scale; PCS= Peer Conflict Scale; RSTI-A= Risk-Sophistication-Treatment Inventory- Abbreviated.

* $p < .05$, ** $p < .01$.

Psychopathy and Substance Use Relationship

To assess the relationship between psychopathy and SU, zero-order correlations between all SU measures and the APSD and YPI-S were calculated and are displayed in Table 6. While only Grandiose-Manipulative YPI-S scores were significantly correlated with the ADS, total, Narcissism, and Impulsive APSD scores were moderately significantly related to multiple SU outcomes. Specifically, APSD total scores were negatively related to age of SU onset and positively related to both CRAFFT and ADS severity of use scores. APSD Narcissism and Impulsivity were positively correlated with CRAFFT scores while no APSD factors were associated with SU frequency.

Table 5

Descriptive and Inferential Statistics for Mean Differences between Boys and Girls on SU, Psychopathy, Reactive Violence, Risk for Offending, and Motivation to Change

Measure	Male <i>M</i> (<i>SD</i>)	Female <i>M</i> (<i>SD</i>)	<i>t</i>	<i>d</i>
APSD Total	14.53 (5.29)	11.14 (6.28)	1.55	.58
Narcissism	3.94 (2.55)	3.00 (2.00)	.93	.41
Callous-Unemotional	4.49 (2.56)	3.14 (2.85)	1.33	.49
Impulsivity	4.68 (2.03)	3.71 (1.98)	1.18	.48
YPI-S Total	43.03 (9.30)	34.57 (9.95)	2.23*	.89
Grandiosity-Manipulative	15.38 (3.91)	13.29 (4.50)	1.30	.50
Callous-Unemotional	12.75 (4.25)	9.29 (4.31)	2.01*	.80
Impulsive-Irresponsible	15.06 (3.76)	12.00 (4.16)	1.99	.77
PCS Reactive Total	13.71 (9.31)	10.11(10.02)	.94	.54
RSTI-A Risk for Offending	18.31 (4.60)	17.71 (5.06)	.32	.12
RSTI-A Motivation to Change	6.30 (2.09)	6.29 (2.56)	.01	.00
CRAFFT	3.64 (1.71)	2.57 (1.51)	1.56	.66
ADS	5.40 (3.89)	3.67 (4.80)	.98	.28
Frequency of SU	6.79 (2.77)	5.43 (3.10)	1.20	.46
Age of SU Onset	12.20 (2.52)	12.86 (2.27)	-.65	-.28

Note. Independent samples *t*-tests between boys and girls were conducted for each measure; APSD= Antisocial Process Screening Device; YPI-S= Youth Psychopathic Traits Inventory: Short Version; PCS= Peer Conflict Scale; RSTI-A= Risk-Sophistication-Treatment Inventory- Abbreviated; ADS= Alcohol Dependence Scale; SU= Substance Use; *d*= Cohen's effect size.

* $p < .05$.

In order to assess if the relationship between psychopathy and SU is dependent on criminal risk, participants were divided into two groups using the median split of RSTI-A Risk for Offending scores ($Mdn= 18$). High risk was denoted as those who scored above the median ($n= 24$) while those who scored below the median were classified as low risk ($n= 21$). Ten participants who scored at the median were excluded from the analyses. The median split was used because no cutoff criterion has been developed for the abbreviated version of the RSTI.

Table 6

Correlations between APSD and YPI-S Total and Factor Scores with SU Measures

Measure	SU Onset	Frequency	CRAFFT	ADS
APSD Total	-.33*	.24	.47**	.34*
Narcissism	-.25	.12	.41**	.23
Callous-Unemotional	-.20	.23	.14	.17
Impulsivity	-.18	.07	.33*	.15
YPI-S Total	-.14	.04	.24	.26
Grandiose-Manipulative	-.18	-.03	.19	.37*
Callous-Unemotional	.04	.09	.16	.19
Impulsive-Irresponsible	-.16	.01	.21	.03

Note. SU= Substance Use; APSD= Antisocial Process Screening Device; YPI-S= Youth Psychopathic Traits Inventory: Short Version.

* $p < .05$, ** $p < .01$.

Correlations between the APSD and YPI-S with SU measures based on participant risk groupings are in Table 7. All zero-order correlations between the YPI-S and SU measures were not significant in both high and low risk subsamples. In youth

who scored above the median split, APSD total scores significantly correlated with age of SU onset and CRAFFT scores while Narcissism and Impulsivity factors were also related to the CRAFFT. The effect sizes of these relationships were stronger when compared to the total sample, except the correlation between APSD total and CRAFFT scores.

Concurrent correlations were not significant in the low risk group; however the CU factor was uniquely positively correlated with SU frequency.

Table 7

*Correlations between APSD and YPI-S Total and Factor Scores with SU Measures
Dependent on Participant Risk for Offending*

Measure	SU Onset	Frequency	CRAFFT	ADS
APSD Total	-.59** (-.31)	.21 (.17)	.45* (.40)	.11 (.32)
Narcissism	-.26 (-.11)	.22 (-.17)	.52* (.17)	.11 (.25)
Callous-Unemotional	-.41 (-.28)	-.06 (.50*)	-.25 (.26)	.11 (.09)
Impulsivity	-.17 (-.22)	.24 (-.07)	.46* (.19)	-.26 (.13)
YPI-S Total	.05 (-.19)	.20 (-.29)	-.04 (.10)	-.07 (.20)
Grandiose-Manipulative	.03 (-.27)	.14 (-.38)	.13 (-.08)	.18 (.32)
Callous-Unemotional	.20 (-.14)	-.06 (.02)	-.25 (.21)	.05 (.07)
Impulsive-Irresponsible	-.16 (.09)	.00 (-.32)	.12 (-.04)	-.34 (-.05)

Note. Correlations outside parentheses denote participants above the RSTI-A Risk for Offending median split ($n=24$); Correlations inside parentheses denote participants below the median split ($n=21$); SU= Substance Use; APSD= Antisocial Process Screening Device; YPI-S= Youth Psychopathic Traits Inventory: Short Version.

* $p < .05$, ** $p < .01$.

The significance of the differences between high and low risk youth were found using Fisher z-transformations. Results revealed that the correlations between APSD total

scores and age of SU onset ($z = -1.11, p = .27$) and CRAFFT scores ($z = .19, p = .85$) were not significantly stronger in high risk youth than low risk youth. Correlations between the CRAFFT and APSD Narcissism ($z = 1.26, p = .21$) and Impulsivity factors ($z = .95, p = .34$) were also not significantly stronger in high risk youth. Risk groups did not differ in the relationship between the APSD CU factor and SU frequency ($z = 1.90, p = .058$).

Gender differences in the psychopathy-SU relationship were also examined as was done with risk. Results are reported in Table 8. When boys were examined independently, only the correlations between CRAFFT scores and APSD total and Narcissism scores were significant. When only girls were investigated, APSD CU scores were strongly negatively correlated with SU onset and the APSD Narcissism factor was strongly positively related to ADS scores. While not significant, the effect sizes of the associations between APSD total scores with age of SU onset and ADS were also strong. Fisher z -transformations on these relationships for boys and girls revealed that the correlation between APSD Narcissism and ADS scores was significantly stronger in girls than boys ($z = -2.03, p = .043$) and that APSD CU scores in girls were related to earlier age of SU onset than in boys ($z = 2.67, p = .008$).

All correlations between SU and the YPI-S were not significant in boys and girls, however the effect sizes of the relationships between YPI-S total, Grandiose-Manipulative, and CU scores with SU onset were strong in girls and only weakly related in boys. Similarly, girls appeared to show stronger associations between the YPI-S Grandiose-Manipulative factor and severity of SU (CRAFFT and ADS). Unlike the gender differences with the APSD, Fisher z -transformations found that these gender differences were not statistically significant.

Table 8

Correlations between APSD and YPI-S Total and Factor Scores with SU Measures

Dependent on Participant Gender

Measure	SU Onset	Frequency	CRAFFT	ADS
APSD Total	-.27 (-.71)	.27 (-.12)	.46** (.46)	.24 (.65)
APSD Narcissism	-.22 (-.48)	.10 (.08)	.37* (.66)	.11 (.87*)
APSD Callous-Unemotional	-.08 (-.90**)	.24 (.05)	.13 (-.02)	.11 (.33)
APSD Impulsivity	-.16 (-.23)	.13 (-.55)	.27 (.57)	.10 (.26)
YPI-S Total	-.06 (-.54)	.03 (-.23)	.18 (.25)	.21 (.33)
YPI-S Grandiose-Manipulative	-.12 (-.55)	-.03 (-.29)	.10 (.56)	.31 (.60)
YPI-S Callous-Unemotional	.15 (-.61)	.04 (.10)	.09 (-.18)	.17 (.07)
YPI-S Impulsive-Irresponsible	-.15 (-.07)	.02 (-.35)	.17 (.19)	-.04 (.01)

Note. Correlations outside parentheses denote male participants ($n=48$); Correlations inside parentheses denote female participants ($n=7$); SU= Substance Use; APSD= Antisocial Process Screening Device; YPI-S= Youth Psychopathic Traits Inventory: Short Version.

* $p < .05$, ** $p < .01$.

Impulsive Psychopathic Traits, Severity of Alcohol Use, and Reactive Violence

Two three-step hierarchical linear regressions were conducted to investigate the main effects and nature of the interaction between severity of alcohol use and impulsive psychopathic traits in predicting reactive violence. Gender and ethnicity were entered into the first step of each regression in order to control for potential confounding effects of each factor. Ethnicity was dichotomous as the only participant who identified as biracial did not use alcohol and was not included in either regression. To investigate the main effects of each predictor, mean centred ADS scores were entered into the second step of

each regression while one test used mean centred APSD Impulsivity scores while the other used concurrent centred YPI-S Impulsive-Irresponsible scores. The interaction term of the two centred predictors was entered into the third step of each regression. PCS reactive total scores were used as the outcome variable in both tests. The family-wise error rate was controlled by using a Bonferroni correction ($\alpha_{fw} = .05$).

While univariate outliers were previously removed, multivariate outlier detection for this set of tests was also conducted. For both regressions one case was identified as an extreme multivariate outlier based on centred leverage scores, standardized DFFITs, and DFBETAs for centred ADS scores and the interaction terms and was removed. After multivariate outliers were removed, all multiple linear regression assumptions were assessed. Predictors and outcome variables showed good reliability in terms of internal consistencies ($\alpha > .70$), except for APSD Impulsivity scores which showed lower reliability ($\alpha = .55$) and the normal probability plots of the residuals showed that the errors of each test were normal. Plots of the standardized residuals as a function of standardized predicted values appeared to show a linear relationship between predictors and outcome variables and that the assumption of homoscedasticity was met in each test. Multicollinearity was not observed as tolerance as above .78 for all predictors.

Results of the regression using centred APSD Impulsivity scores as a predictor are displayed in Table 9 while Table 10 presents the results using centred YPI-S Impulsive-Irresponsible scores as a predictor. In each regression, step one controlling for gender and ethnicity did not significantly predict PCS reactive violence. While gender uniquely predicted approximately 12% of the variance in total PCS reactive scores in both tests, boys were only found to have higher reactive scores before family-wise error correction.

The main effects of centred APSD Impulsivity and ADS scores did not significantly predict total PCS reactive violence scores above the effects of gender and ethnicity in step one, $F_{change}(2, 34) = .91, p = .41, R^2_{change} = .04$. Similarly, the main effects of centred YPI-S Impulsive-Irresponsible¹ and ADS scores did not significantly predict reactive violence above the controlled demographic factors, $F_{change}(2, 35) = 1.73, p = .18, R^2_{change} = .08$. As shown in Table 9 and 10, at step three of each regression the two-way interaction terms between APSD and YPI-S impulsive psychopathic traits and ADS scores were not significant above the main effects of either factor².

Table 9

Regression Statistics for the Prediction of PCS Reactive Violence Scores from Mean Centred APSD Impulsivity and ADS Scores

Predictor	<i>t</i>	<i>B</i>	<i>SE B</i>	β	<i>sr</i> ²
Step 1: Gender	2.20*	8.19	3.72	.34	.117
Ethnicity	-.77	-2.45	3.24	-.12	.014
Step 2: APSD Impulsive	1.35	.92	.68	.22	.044
ADS	-.04	-.01	.36	-.01	.000
Step 3: ADS x APSD Impulsive	-.15	-.03	.20	-.03	.001

Note: APSD= Antisocial Process Screening Device; ADS= Alcohol Dependence Scale; ADS x APSD Impulsive= Interaction between centred ADS and APSD Impulsive scores; *n*= 39

* $p < .05$.

¹ When gender was removed from the model, the main effect of YPI-S II scores in predicting PCS reactive violence was significant after controlling for the ADS, $t = 2.18, p = .036$; the relationship was not significant after the family-wise Bonferonni correction.

² Main effects and two-way interactions were not significant when boys were analyzed independent of girls.

Table 10

Regression Statistics for the Prediction of PCS Reactive Violence Scores from Mean Centred YPI-S Impulsive-Irresponsible and ADS Scores

Predictor	<i>t</i>	<i>B</i>	<i>SE B</i>	β	<i>sr</i> ²
Step 1: Gender	2.24*	8.63	3.86	.34	.116
Ethnicity	.88	2.96	3.36	.14	.018
Step 2: YPI-S II	1.86	.63	.34	.29	.077
ADS	.21	.08	.37	.04	.001
Step 3: ADS x YPI-S II	-1.11	-.01	.09	-.18	.028

Note: YPI-S II= Youth Psychopathic Traits Inventory: Short Version Impulsive-Irresponsible factor; ADS= Alcohol Dependence Scale; ADS x YPI-S II = Interaction between centred ADS and YPI-S II scores; *n*= 40.

* *p* < .05.

Psychopathy, Substance Use, and Motivation to Change

Two sets of three three-step hierarchical linear regressions were conducted to investigate the main effects, two-way interactions, and three-way interaction between RSTI-A Motivation to Change scores, total APSD and YPI-S scores, and all SU measures in predicting risk for offending as measured by the RSTI-A. In the first set of three tests, mean centred Motivation to Change and APSD total scores were entered into step one of each regression while centred age of SU onset, SRD SU frequency, and CRAFFT scores were each entered into separate regressions as a SU predictor.

The other family of tests was identical, except mean centred YPI-S total scores were entered into the first step of the regression instead of APSD total scores. This was done so that the main effects of both the APSD and YPI-S in predicting risk could be compared while controlling for all SU measures and Motivation to Change in each family

of tests. Within each test all corresponding two-way interactions between the terms entered in step one were entered into step two of the regression while the concurrent three-way interaction term was included in the third step. Within each set of three tests the family-wise error rate was controlled using a Bonferroni correction ($\alpha_{fw} = .05$).

In addition to univariate outlier removal, multivariate outliers were assessed for each regression. For all tests using mean centred APSD total scores as a predictor, one case was identified as having extreme centred leverage scores and standardized DFFITs and was removed. An additional outlier was detected and removed only when APSD total scores and age of SU onset were entered into the model. In results using centred YPI-S scores as a predictor, a single multivariate outlier was detected and removed from tests using CRAFFT and SRD SU frequency scores, while no outliers were viewed as extreme when age of SU onset was examined.

After multivariate outliers were removed, all multiple linear regression assumptions were assessed for each test. Each factor was measured reliably ($\alpha \geq .70$) and normal probability plots of the residuals showed that the errors of each test appeared normal, even in the two regressions using skewed SU frequency scores. In each regression multicollinearity between predictors was not found. Plots of the standardized residuals as a function of standardized predicted values appeared to show a linear relationship between predictors and outcome variables and that the assumption of homoscedasticity was met in each of the six tests.

Results of the regressions using age of SU onset as a predictor are displayed in Table 11, while Table 12 and Table 13 present results when CRAFFT and SRD SU frequency scores are used as predictors, respectively. As such, each table displays the

results for both sets of tests using total centred APSD and YPI-S scores, allowing for a direct comparison between different psychopathy self-report measures. For the three regressions using the YPI-S, approximately 32% of the variance in RSTI-A Risk for Offending scores was accounted for by the main effects while there was more variability in tests using the APSD. Specifically, 41.4% of the variance was explained by the main effects when age of SU onset was used as a predictor compared to 26.2% of the variance when SU frequency was entered as a predictor. Similar to tests with the YPI-S, 31.3% of the variance was accounted for when CRAFFT scores were used as the SU predictor.

Table 11

Regression Statistics for the Prediction of RSTI-A Risk for Offending Scores from Mean Centred Psychopathy Scores, RSTI-A Motivation to Change Scores, and Age of SU Onset

Predictor	<i>t</i>	<i>B</i>	β	<i>sr</i> ²
Step 1: Psychopathy	2.52** (2.31*)	.28 (.13)	.30 (.28)	.080 (.074)
Motivation	-3.90** (-3.10**)	-.99 (-.79)	-.44 (-.37)	.189 (.133)
Age of SU Onset	-2.03* (-2.96**)	-.46 (-.64)	-.24 (-.35)	.051 (.121)
Step 2: Psycho x Motiv	-2.56** (-.09)	-.14 (.00)	-.34 (-.01)	.073 (.000)
SU Onset x Motiv	-2.01 (.09)	-.29 (.01)	-.27 (.01)	.045 (.000)
Psycho x SU Onset	.75 (.96)	.03 (.03)	.09 (.13)	.006 (.013)
Step 3: Three-way Interaction	-.65 (-.75)	-.01 (-.01)	-.08 (-.15)	.005 (.008)

Note: Statistics outside parentheses were calculated with APSD total scores ($n=52$); Statistics inside parentheses were calculated with YPI-S total scores ($n=55$); Psycho x Motiv= Motivation to Change and psychopathy interaction; SU Onset x Motiv= Motivation to Change and age of SU onset interaction; Psycho x SU Onset= Psychopathy-age of SU onset interaction; Three-way Interaction= Motivation to Change, psychopathy, age of SU onset interaction.

* $p < .05$; ** $p < .017$.

Table 12

Regression Statistics for the Prediction of RSTI-A Risk for Offending Scores from Mean Centred Total Psychopathy, RSTI-A Motivation to Change, and CRAFFT Scores

Predictor	<i>t</i>	<i>B</i>	<i>B</i>	<i>sr</i> ²
Step 1: Psychopathy	2.47** (2.46**)	.31 (.16)	.33 (.30)	.089 (.087)
Motivation	-3.06** (-3.12**)	-.82 (-.83)	-.37 (-.38)	.137 (.141)
CRAFFT	1.21 (2.06*)	.45 (.69)	.16 (.25)	.021 (.061)
Step 2: Psycho x Motiv	-1.91 (-.41)	-.11 (-.01)	-.26 (-.06)	.048 (.002)
CRAFFT x Motiv	-.26 (-.94)	-.06 (-.25)	-.04 (-.16)	.001 (.013)
Psycho x CRAFFT	-1.31 (-1.31)	-.11 (-.06)	-.18 (-.18)	.023 (.024)
Step 3: Three-way	.66 (-.01)	.05 (.00)	.16 (.00)	.006 (.000)

Note: Statistics outside parentheses were calculated with APSD total scores ($n=53$); Statistics inside parentheses were calculated with YPI-S total scores ($n=54$); Psycho x Motiv= Motivation to Change and psychopathy interaction; CRAFFT x Motiv= Motivation to Change and CRAFFT interaction; Psycho x CRAFFT= Psychopathy and CRAFFT interaction; Three-way = Motivation to Change, psychopathy, CRAFFT interaction.

* $p < .05$; ** $p < .017$.

Investigations of the main effects revealed that mean centred RSTI-A Motivation to Change scores significantly negatively predicted Risk for Offending after controlling for the family-wise error rate and the main effects of all psychopathy and SU measures. Similarly, both centred APSD and YPI-S scores positively predicted risk when all SU measures were controlled before family-wise correction. After the Bonferroni adjustment, however, centred YPI-S scores did not predict risk when age of SU onset was included as the SU predictor while APSD total scores no longer predicted risk when SU frequency was included in step one. In terms of the main effects of SU, an earlier age of SU was

related to increased Risk for Offending scores when the main effects of Motivation to Change and the YPI-S were controlled for in step one, however this relationship was not significant after error correction when the APSD was used as the psychopathy measure. Additional SU main effects were not significant after family-wise error correction.

Table 13

Regression Statistics for the Prediction of RSTI-A Risk for Offending Scores from Mean Centred Total Psychopathy, RSTI-A Motivation to Change, and SRD Frequency of SU Scores

Predictor	<i>t</i>	<i>B</i>	<i>B</i>	<i>sr</i> ²
Step 1: Psychopathy	2.29* (3.44**)	.29 (.20)	.29 (.41)	.081 (.162)
Motivation	-2.60** (-3.04**)	-.74 (-.79)	-.33 (-.37)	.104 (.127)
SU Frequency	.99 (.95)	.22 (.19)	.13 (.12)	.015 (.012)
Step 2: Psycho x Motiv	-2.42* (-1.31)	-.14 (-.03)	-.31 (-.17)	.082 (.024)
Freq x Motiv	.39 (-.49)	.06 (-.07)	.06 (-.08)	.002 (.003)
Psycho x Freq	-.97 (-1.14)	-.06 (-.03)	-.13 (-.17)	.013 (.018)
Step 3: Three-way	.18 (1.29)	.01 (.03)	.03 (.29)	.000 (.023)

Note: Statistics outside parentheses were calculated with APSD total scores ($n=53$); Statistics inside parentheses were calculated with YPI-S total scores ($n=54$); Psycho x Motiv= Motivation to Change and psychopathy interaction; Freq x Motiv= Motivation to Change SU frequency interaction; Psycho x Freq = Psychopathy and SU frequency interaction; Three-way = Motivation to Change, psychopathy, SU frequency interaction.
* $p < .05$; ** $p \leq .017$.

Step two of the regressions containing the two-way interaction terms between centred Motivation to Change scores, APSD total scores, and age of SU onset approached significance in explaining the variance in RSTI-A Risk for Offending scores above the

main effects of each predictor before Bonferroni adjustment, $F_{change}(3, 44) = 2.78$, $p = .052$, $R^2_{change} = .093$. Analysis of the individual interaction terms revealed that the interaction between Motivation to Change and APSD total scores was significant after family-wise error correction while the motivation-age of SU onset interaction approached significance, $p = .051$. Assessment of simple slopes indicated that APSD scores were only significantly positively predictive of risk when Motivation to Change was low (i.e., one SD below the mean), $B = .77$, $SE = .20$, $t(50) = 3.80$, $p < .001$, and that Motivation to Change was only related to decreased Risk for Offending when SU was initiated later in adolescence (i.e., one SD above the mean), $B = -1.70$, $SE = .71$, $t(50) = -2.08$, $p = .021$. This interaction was not significant after error correction. Figure 1 depicts the interaction between the APSD and Motivation to Change while Figure 2 presents the interaction between Motivation to Change and age of SU onset³.

Similarly, step two of the concurrent test with centred CRAFFT scores instead of age of SU onset also approached significance in accounting for the variance in Risk for Offending scores above the main effects from step one, $F_{change}(3, 44) = 2.76$, $p = .053$, $R^2_{change} = .109$. However, unlike the regression with age of SU onset, the two-way interaction terms were not significant. When SU frequency scores were used as the SU predictor, a comparable interaction between APSD and Motivation to Change scores was found as Figure 1, however the interaction term was not significant after controlling for the family-wise error rate. In the family of tests using the YPI-S as a psychopathy predictor no significant two-way interactions were found. Three-way interactions were not significant in any regression.

³ When girls were removed from the analyses, all interaction terms and main effects that were significant after error correction remained significant.

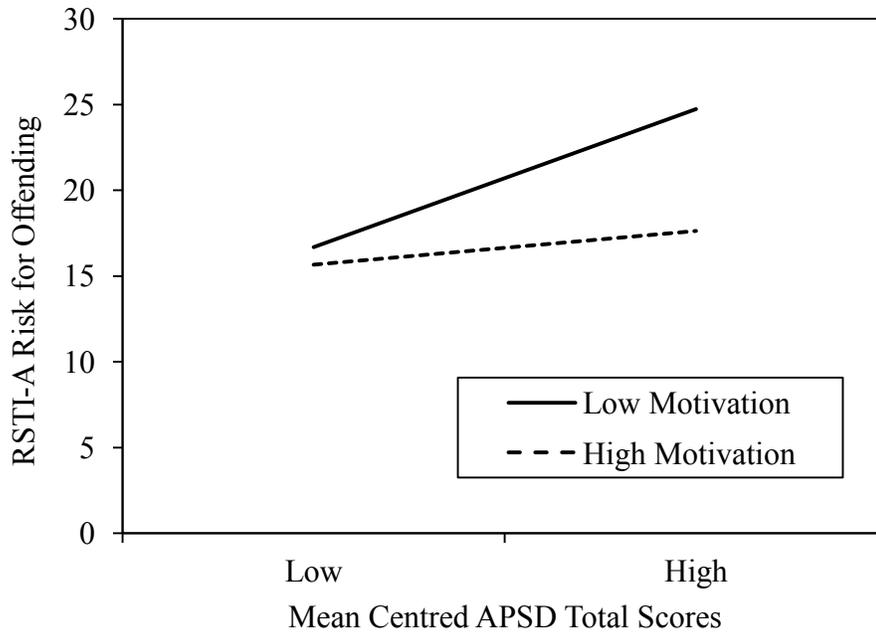


Figure 1. Interaction between mean centred total APSD scores and RSTI-A Motivation to Change scores in predicting RSTI-A Risk for Offending scores. High and low values of each predictor represent one standard deviation above and below the mean, respectively.

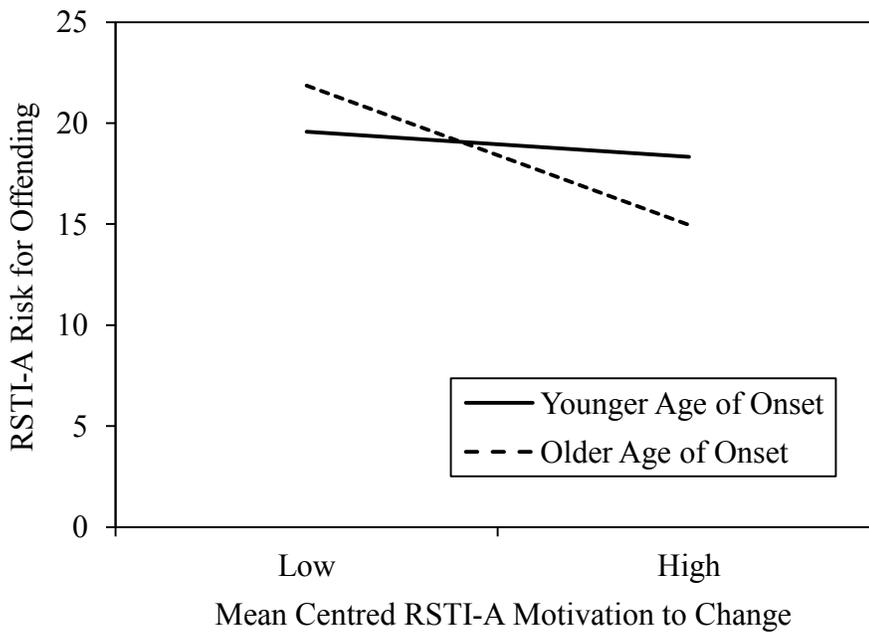


Figure 2. Interaction between mean centred RSTI-A Motivation to Change scores and age of substance use onset in predicting RSTI-A Risk for Offending scores. High and low values of each predictor represent one standard deviation above and below the mean, respectively.

Discussion

The current study investigated the nature of the relationship between psychopathy and SU in adolescent offenders, with specific focus on the interaction between psychopathy, SU, and motivation to change in predicting risk for offending. The study also examined the association between severity of alcohol use and impulsive psychopathic traits in predicting reactive violence. In doing so, this study aimed to investigate if these specific risk and responsivity factors can be integrated in the juvenile justice system in order to improve risk assessment and possible treatment directions. Results of the present study partially support the validity of psychopathy, SU, and motivation to change in this regard.

As predicted, total ASPD scores were moderately related to multiple SU outcomes, including an earlier onset of SU and increased severity of drug and alcohol use as measured by the CRAFFT and ADS, respectively. Consistent with Wymbs et al. (2012), APSD CU traits were unrelated to SU as expected. Furthermore, the impulsive characteristics of psychopathy as measured by the APSD were moderately associated with severity of SU in the present study as hypothesized. Such results replicate past findings that impulsive psychopathic traits are most strongly and consistently associated with SU in adolescence (Kimonis et al., 2012; Nijhof et al., 2011; Vaughn et al., 2009). These results also extend the findings that some self-report measures of psychopathy, such as the APSD, are predictive of an earlier age of SU onset as was previously found with the PCL:YV (Mailloux et al., 1997).

However, contrary to the hypothesis these relationships were not significant across all measures of SU. Total psychopathy scores were not significantly related to SU

frequency and the impulsive factor was not related to age of SU onset, severity of alcohol use, or SU frequency. The APSD Narcissism factor was also unexpectedly significantly related to CRAFFT scores and was more strongly related than APSD Impulsivity scores. While research investigating the APSD has found that impulsive traits are most strongly related to SU often to the exclusion of other psychopathy factors, other research has found that psychopathic personality characteristics and PCL:YV Factor 1 scores are also related to SU (Loper et al., 2001; O'Neil et al., 2003). This could account for why APSD Narcissism scores, analogous with interpersonal traits in the four-factor model, were significantly correlated with CRAFFT scores in the present study. However, caution should be used when generalizing the Narcissism-age of SU onset relationship to all SU outcomes (i.e., SU frequency and severity). This is because Narcissism was only related to one SU outcome in the present study and other potential confounding factors related to SU and psychopathic personality traits, such as internalizing and externalizing disorders, were not controlled for in the zero-order correlations.

Further limiting the generalizability of these findings was that they were not consistent across both measures of psychopathy as was hypothesized. Although the direction of the correlations between YPI-S scores and SU were similar to those found when the APSD was used as a predictor, correlations between YPI-S scores and all SU outcomes were not significant in the present study, except with the ADS. Even though the APSD and YPI-S display similar factor structures that showed moderate to strong intercorrelations in the present study, these findings suggest that there could be a differential relationship between the two measures in their ability to predict SU. Because previous research has found that the original YPI, especially the Impulsive-Irresponsible

factor, is related to multiple SU indices in both boys and girls (Hillege et al., 2010; Kimonis et al., 2012; Nijhof et al., 2011), this difference may be due to the condensed nature of the YPI-S. As such, the present study reinforces the notion that forensic research should not rely solely on a single self-report measure of psychopathy and that more research is needed to validate the validity of the YPI-S in relation to the original YPI.

The hypothesis that the relationship between psychopathy and SU would be consistent across high and low levels of criminal risk was partially supported. While there were no significant differences in the magnitudes of association between all SU measures and the APSD and YPI-S as expected, the relationships that were significant in the total sample were only significant in the high risk group. Unexpectedly, APSD CU traits were also uniquely associated with SU frequency only in the low risk group. Even though these findings could provide initial evidence that there may be a differential association between high and low risk offenders in how SU and psychopathy are related, it should be noted that such differences were not robust across psychopathy measures and SU outcomes and could be due to the loss of power after splitting the sample into two smaller groups. Additionally, the magnitudes of the correlations in the low risk group were consistent or *stronger* than the significant results found by Hillege and colleagues (2011) which examined lower risk youth from the general school population. However, more research investigating lower risk juvenile offenders as proposed by Kimonis et al. (2012) is still needed before these conclusions can be substantiated.

Contrary to expectations, the relationship between APSD Narcissism and ADS scores was significantly stronger in girls than boys, as was the association between APSD

CU traits and an earlier age of SU onset. While not significantly different, correlations between YPI-S total, Grandiose-Manipulative, and CU scores with age of SU onset were strong in girls but only weak in boys. However, only small gender differences in magnitude were found when impulsive traits were examined. Although most studies investigating the relationship between psychopathy and SU have found minimal gender differences (Loper et al., 2001; Murrie & Cornell, 2000; Poythress et al., 2006), studies using the YPI have noted similar gender effects as found in the current study.

Specifically, Nijhof and colleagues (2011) found that soft and hard drug use was predicted by impulsive traits in both boys and girls, however CU traits were only related to hard drug use in girls. Similarly, more problematic SU (i.e., increased severity and earlier onset) was only related to psychopathic personality traits in girls in the current study.

What makes these differences particularly surprising is that only seven girls were used in the analyses; even with low power significant differences were detected. While the small sample size limits the generalizability of these findings, they still suggest that gender should be made a more important consideration in future research investigating the association between these two factors. This is especially important given that women have historically been neglected in forensic psychological research. Even though some studies have begun to investigate these differences (i.e., Hillege et al., 2010; Nijhof et al., 2011), most research has only investigated male samples or aggregated participants across gender. In the future, larger sample sizes of female adolescents should be examined in order to properly assess if the differences found in the current study reflect actual phenomena in the population or if they are a product of low sample size.

Contrary to the hypothesis, severity of alcohol dependence symptoms and impulsive psychopathic traits did not significantly predict self-reported reactive violence after controlling for the effects of ethnicity and gender. The current study was unable to replicate past findings that alcohol consumption is related to increased aggression and reactive violence (Boden et al., 2012; White et al., 2013) and that the impulsive features of psychopathy are most strongly related to reactive aggression in adolescent offenders (Flight & Forth, 2007). Alcohol severity of use and impulsive traits also did not interact to affect violence as was expected. There are multiple possibilities why this may have been the case. When gender was not controlled for, impulsive traits as measured by the YPI-S significantly predicted reactive violence before controlling for the family-wise error rate. Subsequently, when girls were removed from the analysis, all results were not significant. This suggests that impulsivity may be particularly important in explaining reactive violence in girls more than boys, at least in the present sample when the effects of alcohol use are controlled. Another possible problem was the use of the ADS as an alcohol use measure, which will be discussed in more detail in the limitations subsection.

The hypothesis that psychopathy, SU, and motivation to change main effects would predict risk for offending was partially supported. Decreased motivation to change was related to increased risk after controlling for the main effects of psychopathy and SU frequency, severity, and age of onset, as predicted. Supporting the hypothesis, both APSD and YPI-S total scores were related to increased risk after controlling for all SU outcomes before family-wise correction. Even after the error rate was adjusted, four of the six psychopathy-risk relationships remained significant. After controlling for other factors related to risk, both psychopathy self-reports were related to increased risk for

offending, even though both measures seemed to show differential abilities in predicting SU. Contrary to what was expected, SU was a less powerful predictor of risk. After Bonferroni correction, only early onset was related to increased risk when YPI-S scores and motivation were controlled.

Although the three-way interactions between psychopathy, motivation, and SU were not significant in predicting risk as expected, some expected two-way interactions were significant above the main effects. APSD psychopathy was only related to increased risk when motivation to change was low after controlling for the effects of age of SU onset. Not only did this finding replicate the interaction found by Salekin, Lee, and colleagues (2010), it also showed that this interaction is present even after controlling for age of SU onset and to a lesser extent SU frequency. By using APSD total and RSTI-A Risk for Offending scores, this study also showed that the interaction between psychopathy and motivation is not limited to the CPS as a predictor and violent recidivism as an outcome variable.

The interaction between age of SU onset and motivation to change also *approached* significance controlling for the effect of the APSD. Specifically, motivation to change was associated with decreased risk, only when youth started using substances later in life. When youth began to use substances earlier in adolescence, increased motivation was not related to decreased risk. Given that past studies have indicated that adolescents often have reduced intrinsic motivation to change SU behaviour (Breda & Heflinger, 2004; Clair et al., 2011; Wisdom et al., 2011), the current study suggests this may be especially true of youth who begin to use substances earlier in life. These findings provide reason for optimism, however, not all two-way interactions were significant as

was predicted. This is especially true of the tests using the YPI-S as a psychopathy predictor, as all pertinent two-way interactions were not significant.

While the current study was unable to find support for all hypotheses, the findings do provide some evidence that psychopathy, SU, and motivation to change should be considered as parts of a larger integrative framework within the juvenile justice system. This is especially true of risk assessment and possible treatment approaches. Even though all measures of psychopathy were not significantly related to SU, psychopathy as measured by the APSD was predictive of increased severity of alcohol and drug use as well as an earlier age of SU onset. As such, the criminal justice system should be cognizant of potential SU problems in high risk youth who display psychopathic traits, particularly those who display impulsive/irresponsible traits or those who display grandiose or narcissistic characteristics. Risk assessments which measure aspects of psychopathy, such as the RSTI, may also want to consider measuring SU in order to better assess risk. In terms of early identification of at risk youth, early SU problems before age 12 may be particularly salient in identifying juveniles who could come in contact with the justice system and display more psychopathic traits as adolescents. It is also possible that children with psychopathic traits could be at increased risk for early onset SU. Future longitudinal research is needed to examine these implications and possible causal mechanisms between SU onset and psychopathy.

The current study also suggests that motivation to change may be an important responsivity factor that can be targeted in treatment with youth with psychopathic traits and later onset SU problems. Traditionally, individuals with psychopathic traits have been viewed as untreatable (Harris & Rice, 2006), however recent research has found that

motivation can be enhanced with subsequent decreases in risk in youth with psychopathic traits (Salekin, Tippey et al., 2012; Salekin, Lester et al., 2012) and SU problems (Clair et al., 2011; Stein et al., 2011). Consequently, motivational based interventions such as MI could be useful in increasing motivation to change and reducing risk and recidivism in youth with comorbid SU problems and psychopathic traits, especially offenders who begin to use substances later in adolescence. In youth who begin to use substances early in adolescence, preventative based treatments that address concurrent delinquent behaviour, such as deviant peer groups, could be more effective than motivational approaches with these types of offenders (White et al., 1999).

Limitations

The current study is associated with a number of limitations. The central limitations are the homogeneity and size of the sample. Over 80% of the participants were African-American or male, limiting the generalizability of the conclusions to the specific individuals sampled. This means that findings may not apply to youth with multicultural ethnic backgrounds or individuals outside the south-eastern U.S. Furthermore, because only 55 participants were included in the analyses, statistical power was quite low. This sample size could have contributed to increased type II errors, particularly in analyses where smaller subsamples were examined (i.e., high and low risk youth, boys and girls, youth who used alcohol).

Of particular concern in this area is the underrepresentation of female participants. Because the sample of girls was so small, it was difficult to isolate the individual effects of gender in both sets of regression analyses and many of the correlations between psychopathy and SU. This was especially important because there appeared to be some

gender differences in the limited data. Girls scored significantly higher than boys on YPI-S CU and total scores and even showed stronger psychopathy-SU relationships than boys in terms of APSD Narcissism and CU factors. However, because of the small sample size it is difficult to extrapolate these findings to the adolescent female offender population or conclude that robust gender differences definitely exist.

There were also concerns with some of the measures used in the present study. While there was a general overreliance on self-reports to assess key constructs, the ADS was potentially one of the most problematic. Not only was the ADS developed primarily for adults and has limited validity and reliability in adolescent samples, the ADS also measures core physiological symptoms of alcohol dependence. Therefore, individuals who score low on the ADS can still exhibit problem alcohol use associated with disinhibition and increased reactive aggression (Boden et al., 2012). Furthermore, not all youth who score high on the ADS engage in violence. Adolescents may use alcohol to self-medicate or cope with internalizing disorders such as anxiety or depression (Dow & Kelly, 2012) and may not be violent because of their problem use. In this sense, the reasons or motivations for alcohol use and the quantity or severity of use accounts for the relationship with violence. By not considering the motivations for alcohol use in the present study, the true effect of alcohol on risk outcomes cannot be properly assessed. This could explain why ADS scores alone were not related to reactive violence or impulsive psychopathic traits in the current study.

While the two-way interaction between RSTI-A Motivation to Change scores and the APSD was significant in predicting risk, many of the interaction terms including the three-way and the two-way SU-motivation interactions were not significant. This may

have been because the RSTI-A measure of motivation was not SU specific and instead broadly assessed change and treatment interest related to criminal behaviour. Other measures such as the Stages of Change Scale (McConaughy, Prochaska, & Velicer, 1983) based on the TTM could have been used in accordance with the RSTI-A in order to assess motivation to change delinquency *and* SU as was done by Jordan (2008). By assessing both aspects of motivation, the Stages of Change Scale could have helped reveal interactions that involved SU frequency and severity, including the three-way interaction between psychopathy, motivation, and SU.

Future Research Directions

Although future research is needed to address the limitations discussed above, the current findings also present many novel future research directions. While the current study investigated the specific affects of alcohol, future research should investigate the effect of other substances on the psychopathy-SU relationship rather than examining general frequency and severity of SU. This is especially true of cocaine. Whereas most adult and juvenile literature has found that the behavioural dimension of psychopathy is uniquely related to SU, Walsh, Allen, and Kosson (2007) found that cocaine was uniquely related to the personality and interpersonal features of the construct in adult offenders. However, the relationship between cocaine and other specific substances with psychopathy has not been well investigated in juvenile offender populations. In the current study, very few participants admitted to using cocaine and consequently these potential differential affects could not be examined. Future research would be well served to examine this relationship in adolescents, especially in girls. This is because past

research has found that hard drug use appears to be differentially related to psychopathic personality traits in girls rather than boys (Nijhof et al., 2011).

In addition to investigating the effect of different substances on the psychopathy-SU relationship, future research should compare the efficacy of self-report measures of psychopathy to established interview measures, such as the PCL:YV, in their ability to predict SU outcomes. By comparing each self-report measure to the PCL:YV, the effectiveness of self-reports in relation to interview measures in predicting SU can be directly assessed. Additionally, because of the apparent differential relationship between the APSD and YPI-S in predicting SU in the current study, comparing the ability of both measures to the PCL:YV can help clarify which self-report measure is most accurate in terms of SU prediction. Furthermore, research using interview based measures of violence, such as the Reactive and Proactive Aggression Checklist (RPAC; Dodge, Price, Bachorowski, & Newman 1990), can also be used to examine the relationship between psychopathy, alcohol use, and reactive aggression.

The present study investigated how SU and psychopathy are related to different risk measures and motivation to change, however, this study used a retrospective design and did not examine how the association between SU and psychopathy is related to recidivism and long-term offending trajectories. Although longitudinal research has investigated the effects of psychopathy and SU on long-term offending, little research has examined how these factors interact to predict long-term outcomes related to reoffending. This is particularly important given that past research has found that behavioural psychopathic traits and SU are both highly related together and to long-term adult persistent offending patterns. Subsequently, research has not investigated how adolescent

responsivity factors such as motivation to change affect long-term recidivism related to psychopathy and SU. Future longitudinal research should begin to investigate these issues in order to improve the accuracy of long-term risk prediction models as well as our understanding of potential causal pathways to SU.

Future research should also begin to investigate effectiveness of treatment on individuals with comorbid SU and psychopathic traits, specifically the efficacy of MI to increase treatment compliance. Even though recent research suggests motivational interventions can be effective in youth with psychopathic traits (Salekin, Tippey, et al., 2012; Salekin, Lester, et al., 2012) and SU problems (Stein et al., 2006; 2011), an integrated MI strategy to increase motivation to change SU and psychopathy related delinquency has yet to be tested. Given the consistent relationship between these risk factors across studies, MI offers the possibility that a cost effective and easily delivered therapeutic technique can increase treatment compliance in youth who are highly resistant to change at the same time as decreasing risk and problem behaviours that cause recidivism. While the current study did not examine MI, these findings offer initial support that such interventions could be useful in the juvenile justice system with continued research in this area.

Related to SU treatment, research should also begin to examine how motivations for SU affect treatment outcomes in juvenile offenders with concurrent SU problems and psychopathic traits. A recent study by Dow and Kelly (2012) noted that when youth were using substances to cope with problems they showed increased drug abstinence in response to treatment compared to youth who used for other reasons (i.e., enjoyed getting high), even after controlling for the effects of motivation to change and self-efficacy.

Most interestingly, adolescents who used substances to cope displayed more severe SU prior to treatment as well as increased comorbid internalizing disorders, yet were able to show the most improvement up to 12 months after treatment. Given that psychopathy is related to SU and internalizing disorders (Price et al. 2012), future research should begin to investigate how psychopathy is related to motivations for SU and how these findings extend to juvenile offender populations in terms of long-term risk trajectories and treatment responsivity. Of particular interest could be to examine the efficacy of MI dependent on motivations for SU and psychopathy.

Before psychopathy, SU, and motivation to change can be considered as parts of a larger integrative model, the limitations of the current study need to be addressed and more research is needed to examine the relationship between these risk and responsivity factors. This is particularly true in their relationship to long-term offending patterns and treatment directions. However, the current study still offers initial support that such an integrative framework could be important for the juvenile justice system. Expanding on these findings with future research could be imperative in improving risk prediction models and treatment programs that could help reduce recidivism and the negative impacts caused by juvenile delinquency in Canada and the U.S.

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Appendix A

Guardian Informed Consent Form

Your child is being asked to participate in a research study. The project is described below.

Project: This study will investigate the effectiveness of a psychological measure titled the Risk-Sophistication- Treatment Inventory- Abbreviated (RSTI-A). We are also interested in the relationship between risk maturity and treatment amenability with substance abuse. We will also measure heart rate and perspiration as they are related to maturity. There is also a brief intervention in the study, where your child will watch a power point presentation.

Research Personnel: The research is being conducted by Dr. Randall Salekin (professor of psychology at the University of Alabama) and Emily MacDougall (research Assistant, University of Alabama), Dr. Adelle Forth (Professor, Carleton University), and Christopher Gillen (research Assistant, Carleton University).

Purpose and Task Requirements: The purpose of the informed consent form is to obtain your permission for your son/daughter to participate in the research study. The parental consent helps to ensure that you understand the purpose of the study and the nature of your son or daughter's involvement in it. The informed consent and information form is intended to provide enough information such that you have the opportunity to decide whether you wish to allow your son/daughter to participate in this study.

Your son or daughter will first be asked to fill out self-report measures related to personality, aggression, academic performance, and substance abuse. Once he/she is finished completing the questionnaires, your child will be asked a series of questions as part of a semi-structured interview. Questions asked during the interview will be similar to those asked in the self-report measures, but will also include questions about his school and work history, career goals, family life, and peer/sexual relationships. This interview will only be audio-taped if you consent and your son/daughter assents to it being recorded. The researchers will also be reviewing the detention center's file information on your son/daughter. In addition, we will measure your child's heart rate and perspiration by attaching 3 electrodes to their neck and knee (or ankle, if preferred). This is a non-intrusive procedure. Your child will also watch a brief power point presentation on learning and be asked to answer some questions about problem solving. Also, it is important to note that the study is voluntary. The decision to participate, or not, will have no effect on how the youth is treated by the Detention Center, Juvenile Court, or Probation Office, nor will it affect your son or daughters status or length of detention or probation.

Length/Compensation: The time needed to complete the questionnaires and the interview will be between 2 and 3 hours. Your child will be given a break between the questionnaires and interview, but he will be informed that he/she can have any additional breaks he/she wants. Your child will receive \$15 for participation in the study.

Potential Risks and Discomfort: There are minimal risks associated with participation in this study. Your child may feel anxious or embarrassed because of the nature of the interview questions (involving criminal history, substance use, emotional relationships). Participation is entirely voluntary and your child will be informed he/she can refuse to answer any question and will be allowed to stop the study at any time or withhold his/her data without penalty.

Privacy/Confidentiality: Participation in this study is private. Your child's name will not be on the tests themselves. Your child's name will be cross referenced with a master list. This master list will be locked in a file cabinet in the primary investigator's office at the University of Alabama. Although remote, there is the possibility of a breach in confidentiality. Again, however, the information collected and the audio recordings will be identified only by their assigned number and we will keep the cross reference list locked in the primary investigator's office. There are, however, limits to confidentiality and should your child indicate he/she might harm him/herself or someone else, this must be reported. In addition, if he/she reports engaging in any abuse against children this will also be reported. Information from the study will not affect the way your son/daughter is treated by staff at the detention center. The information from the study will not be used to inform future parole or institutional decisions.

I have read the above statement and the letter of information, and freely provide consent for my son/daughter to participate in this study, "**Multi-method Assessment of RSTI-A and a Brief Intervention**". If I have any questions, concerns, or complaints about this study I am aware that I can contact Dr. Randy Salekin by calling 205-348-6619 or emailing rsalekin@as.ua.edu. I can also contact Dr. Adelle Forth by calling 1-613-520-2600 x. 1267 or by email at adelle_forth@carleton.ca. Emily MacDougall can be reached at the University of Alabama (emacdougall@crimson.ua.edu) Christopher Gillen can be contacted by email at cgillen@connect.carleton.ca. If you have questions, concerns, or complaints about your child's rights as a participant in this research study, you may contact Ms. Tanta Myles, the Research Compliance Officer at UA, at 205-348-8461 or toll-free at 1-877-820-3066.

You may also ask questions, make suggestions, or file complaints and concerns through the IRB Outreach website at http://osp.ua.edu/site/PRCO_Welcome.html or email us at participantoutreach@bama.ua.edu. After you participate, you are encouraged to complete

the survey for research participants that is online at the outreach website or you may ask the investigator for a copy of it and mail it to the University Office for Research Compliance, Box 870127, 358 Rose Administration Building, Tuscaloosa, AL 35487-0127.

Signature: _____

Date: _____

Appendix B

Participant Assent Form

We are doing a study to see if a new, shorter interview used to measure risk, maturity, and treatment readiness is as accurate as the longer interview it was based on. We also want to know if this new interview tool is related to alcohol and other drug use. This study will help us see if a new quicker tool can be used in detention centers like this to identify adolescents who need help and figure out who will respond best to treatment. This study also will involve looking at a power point presentation on brain growth and personality and filling out some additional questionnaires and we will also monitor your heart rate and perspiration during the study.

If you want to participate in this study, we are asking you to fill out questions asking you about your personality, aggression, criminal involvement, and alcohol or drug use. Approximately, 120 youth will be asked to complete this study. After you fill these out, you will be asked questions similar to the ones you saw in the questionnaires, but this time in an interview. You will also be asked about your school and work history, future career plans, family life, and about your personal and sexual relationships with other people you know. If you allow us, the interview part of the study will be recorded on audio tape so that only the things you say will be recorded. You will also watch a presentation and fill out some questions. We will also connect 3 electrodes to your knee and neck to measure your heart rate and perspiration during the study. This is a non-intrusive procedure. You will be asked to answer some questions about problem solving. Also, it is important to note that the study is voluntary. The decision to participate or not will have no effect on how the youth is treated by the Detention Center, Juvenile Court, or Probation Office, nor will it affect the status or length of detention or probation. The study will take about 3 hours to complete. You can take more than one break if you need to at any time. Your parent/guardian knows we are asking you to do this study and informed us it was okay for you to participate. After completing the questionnaires and the interview you will receive \$15.

No one will be able to tell what you did and said during this study. We will only talk about all the people together so no one knows who you are. This means your parents and the people here at the detention center will not know what you said or filled out. People won't even know that it's your voice on the audio-recordings.

You are a volunteer and you do not have to participate if you do not want to. If you start the study and feel you want to stop, just let me know and we will stop the study. No one will be mad or upset at you. If you don't want to answer any questions, you don't have to. It is as simple as that.

What are my options to participating in the study?

Your option is to not participate. It is completely up to you.

Risks

There are few known risks associated with participation in this study. You may feel embarrassed or anxious because of the of the interview questions (involving criminal history, substance use, emotional relationships). There is the possibility of connecting your name with the data but this is very unlikely. Although we work hard to prevent this possibility by only putting numbers on the questionnaires you fill out and having a crops reference list that is locked in the Investigators office at the University.

Please ask me if you have any questions about the study now. If you have any questions later you can contact Dr. Randy Salekin by calling 205-348-6619 (email: rsalekin@as.ua.edu) or by emailing Christopher Gillen at cgillen@connect.carleton.ca.

If you have questions, concerns, or complaints about your child's rights as a participant in this research study, you may contact Ms. Tanta Myles, the Research Compliance Officer at UA, at 205-348-8461 or toll-free at 1-877-820-3066.

You may also ask questions, make suggestions, or file complaints and concerns through the IRB Outreach website at http://osp.ua.edu/site/PRCO_Welcome.html or email us at participantoutreach@bama.ua.edu<<mailto:participantoutreach@bama.ua.edu>>. After you participate, you are encouraged to complete the survey for research participants that is online at the outreach website or you may ask the investigator for a copy of it and mail it to the University Office for Research Compliance, Box 870127, 358 Rose Administration Building, Tuscaloosa, AL 35487-0127.

If you agree to be in this study, please sign your name below.

Name: _____ **Signature:** _____ **Date:** _____

Appendix C

Debriefing Statement

What are we trying to learn?

The purpose of this study is to see if a new abbreviated, or shortened version of juvenile assessment measure (the Risk-Sophistication-Treatment Inventory (RSTI-A)) is still as effective as the previous RSTI measure. Of particular interest to the researchers is whether the degree of substance abuse (alcohol and other drug use) is related with risk for dangerousness and if the extent and onset of substance abuse is predictive of treatment amenability, or the likelihood someone will respond positively to treatment, as measured by the RSTI-A. We are also trying to learn whether informing people that their emotional skills or personality can grow affects their performance.

Why is this important?

This study is important to both researchers and the criminal justice system because it will help briefly assess youth on important factors. It will also examine if substance abuse is related to risk and specific treatment factors (i.e., motivation to change). The briefer measure will help more adolescents be efficiently evaluated as they enter the justice system. This shorter period of time will allow for court staff to quickly tailor effective and appropriate treatments to those who will benefit from them. The training aspect of this study is important because it may help youth become better at improving their emotions and personality improving their ability to make sound decisions.

What are our predictions?

We predict that the RSTI-A will be an effective measure with adolescent males and females. Substance abuse will also be positively correlated with overall risk and negatively correlated with treatment amenability, specifically a youth's motivation to change. We suspect that the emotional skills training aspect of the study will work and that it will temporarily improve problem solving abilities.

Who do I contact if I have questions later?

If you have any questions about the research you can contact Dr. Randy Salekin at the University of Alabama by calling 205-348-6619 or by emailing rsalekin@as.ua.edu. You can also contact Christopher Gillen at cgillen@connect.carleton.ca or Dr. Adelle Forth by calling 1-613-520-2600 x. 1267 or by email at adelle_forth@carleton.ca. If you have questions, concerns, or complaints about your child's rights as a participant in this research study, you may contact Ms. Tanta Myles, the Research Compliance Officer at UA, at 205-348-8461 or toll-free at 1-877-820-3066.

You may also ask questions, make suggestions, or file complaints and concerns through the IRB Outreach website at http://osp.ua.edu/site/PRCO_Welcome.html or email us at participantoutreach@bama.ua.edu. After you participate, you are encouraged to complete the survey for research participants that is online at the outreach website or you may ask the investigator for a copy of it and mail it to the University Office for Research Compliance, Box 870127, 358 Rose Administration Building, Tuscaloosa, AL 35487-0127.

Appendix D**Antisocial Process Screening Device (Frick & Hare, 2001)**

Instructions: Please read each statement and decide how well it describes you. Mark your answer by circling the appropriate number (0-2) for each statement. Do not leave any statement unrated.

0= Not at all true; 1= Sometimes true; 2= Definitely true

	Rating		
1. I blame others for my mistakes	0	1	2
2. I engage in illegal activities	0	1	2
3. I care about how well I do at school or work	0	1	2
4. I act without thinking of the consequences	0	1	2
5. My emotions are shallow and fake	0	1	2
6. I lie easily and skillfully	0	1	2
7. I am good at keeping promises	0	1	2
8. I brag a lot of about my abilities, accomplishments, and my possessions	0	1	2
9. I get bored easily	0	1	2
10. I use or "con" others to get what I want	0	1	2
11. I tease or make fun of other people	0	1	2
12. I feel bad or guilty when I do something wrong	0	1	2
13. I do risky or dangerous things	0	1	2
14. I act charming and nice to get things I want	0	1	2
15. I get angry when corrected or punished	0	1	2
16. I think I am better or more important than other people	0	1	2
17. I do not plan ahead or I leave things to "the last minute"	0	1	2
18. I am concerned about the feelings of others	0	1	2
19. I hide my feelings or emotions from others	0	1	2
20. I keep the same friends	0	1	2

Appendix E**Peer Conflict Scale (Marsee & Frick, 2007)**

Instructions: Please read each statement and decide how well it describes you. Mark your answer by circling the appropriate number (0-3) for each statement. Do not leave any statement unrated. Please answer questions on both sides of the page.

	Not at all true	Somewhat true	Very true	Definitely true
1. I have hurt others to win a game or contest	0	1	2	3
2. I enjoy making fun of others	0	1	2	3
3. When I am teased, I will hurt someone or break something	0	1	2	3
4. Sometimes I gossip about others when I'm angry at them	0	1	2	3
5. I start fights to get what I want	0	1	2	3
6. I deliberately exclude others from my group, even if they haven't done anything to me	0	1	2	3
7. I spread rumors and lies about others when they do something wrong to me	0	1	2	3
8. When someone hurts me, I end up getting into a fight	0	1	2	3
9. I try to make others look bad to get what I want	0	1	2	3
10. When someone upsets me, I tell my friends to stop liking that person	0	1	2	3
11. I threaten others when they do something wrong to me	0	1	2	3
12. When I hurt others, it makes me feel powerful and respected	0	1	2	3
13. I tell others' secrets for things they did to me a while back	0	1	2	3
14. When someone threatens me, I end up getting into a fight	0	1	2	3
15. I make new friends to get back at someone who has made me angry	0	1	2	3
16. I hurt others when I am angry at them	0	1	2	3
17. When others make me mad, I write mean notes and pass them around	0	1	2	3
18. I threaten others to get what I want	0	1	2	3

19. I gossip about others to become popular	0	1	2	3
20. If others make me mad, I hurt them	0	1	2	3
21. I am deliberately cruel to others, even if they haven't done anything to me	0	1	2	3
22. When I am angry at others, I try to make them look bad	0	1	2	3
23. To get what I want, I try to steal others' friends from them	0	1	2	3
24. I carefully plan how to hurt others	0	1	2	3
25. When someone makes me mad, I throw things at them	0	1	2	3
26. When I gossip about others, I feel like it makes me popular	0	1	2	3
27. I hurt others for things they did to me a while back	0	1	2	3
28. I enjoy hurting others	0	1	2	3
29. I spread rumors and lies about others to get what I want	0	1	2	3
30. When I have gotten into arguments or physical fights, it is usually because I acted without thinking	0	1	2	3
31. If others make me mad, I tell their secrets	0	1	2	3
32. I ignore or stop talking to others in order to get them to do what I want	0	1	2	3
33. I like to hurt kids smaller than me	0	1	2	3
34. When others make me angry, I try to steal their friends from them	0	1	2	3
35. I threaten others, even if they haven't done anything to me	0	1	2	3
36. When I get angry, I will hurt someone	0	1	2	3
37. I have gotten into fights, even over small insults from others	0	1	2	3
38. When I have started rumors about someone, it is usually because I acted without thinking	0	1	2	3
39. I say mean things about others, even if they haven't done anything to me	0	1	2	3
40. When someone makes me angry, I try to exclude them from my group	0	1	2	3

Appendix F

Self-Report of Delinquency (Elliot, et al., 1985)

Instructions: For the following questions, circle the number from 1 to 9 in the box called “frequency” which corresponds with the frequency you have done the behavior, where:

- 1= never
- 2=Once or twice
- 3=Once every 2-3 months
- 4=Once a month
- 5=Once every 2-3 weeks
- 6= Once a week
- 7= 2-3 times a week
- 8= Once a day
- 9= 2-3 times a day

	Frequency								
1. Damaged family property	1	2	3	4	5	6	7	8	9
2. Damaged other property	1	2	3	4	5	6	7	8	9
3. Stolen something worth more than \$50	1	2	3	4	5	6	7	8	9
4. Bought stolen goods	1	2	3	4	5	6	7	8	9
5. Set fire to property	1	2	3	4	5	6	7	8	9
6. Carried a hidden weapon	1	2	3	4	5	6	7	8	9
7. Been paid for sexual relations	1	2	3	4	5	6	7	8	9
8. Paid someone for sexual relations	1	2	3	4	5	6	7	8	9
9. Been in gang fights	1	2	3	4	5	6	7	8	9
10. Used checks or credit cards illegally or without permission	1	2	3	4	5	6	7	8	9
11. Sold marijuana or other drugs	1	2	3	4	5	6	7	8	9
12. Stolen money from family	1	2	3	4	5	6	7	8	9
13. Had sexual relations against someone’s will	1	2	3	4	5	6	7	8	9
14. Hit or attacked parent	1	2	3	4	5	6	7	8	9
15. Hit or attacked other student or teacher	1	2	3	4	5	6	7	8	9
16. Tried to sell something worthless	1	2	3	4	5	6	7	8	9
17. Taken or stole someone’s vehicle	1	2	3	4	5	6	7	8	9
18. Bought liquor for a minor	1	2	3	4	5	6	7	8	9
19. Been drunk or high	1	2	3	4	5	6	7	8	9
20. Stolen things worth less than \$50	1	2	3	4	5	6	7	8	9
21. Broken into building or house	1	2	3	4	5	6	7	8	9
22. Made obscene phone calls	1	2	3	4	5	6	7	8	9
23. Used force or weapon to rob someone or businesses	1	2	3	4	5	6	7	8	9

Appendix G
CRAFFT (Knight et al., 1999)

Preliminary Questions:

1. When did you first begin to use alcohol or other drugs? _____
2. In the past 12 months did you
 - a) drink any alcohol (more than a few sips)
 - b) used anything else to get high, including illegal drugs, over-the-counter or prescription drugs, or things you sniffed or “huffed” (i.e., paint thinner or gasoline).

1. Have you ever ridden in a CAR driven by someone (including yourself) who was “high” or had been using alcohol or drugs?	YES	NO
2. Do you ever use alcohol or drugs to RELAX, feel better about yourself, or fit in?	YES	NO
3. Do you ever use alcohol or drugs while you are by yourself, or ALONE?	YES	NO
4. Do you ever FORGET things you did while using alcohol or drugs?	YES	NO
5. Do your FAMILY or FRIENDS ever tell you that you should cut down on your drinking or drug use?	YES	NO
6. Have you ever gotten into TROUBLE while you were using alcohol or drugs?	YES	NO