

Incremental and Predictive Validity of the Antisocial Process Screening Device in a Community Sample of Male and Female Ethnic Minority and Caucasian Youth

Catherine Shaffer, M.A.¹
Dylan Gatner, M.A.¹
Andrew L. Gray, M.A.¹
Kevin S. Douglas, LL.B., Ph.D.^{1,2}
Jodi L. Viljoen, Ph.D.¹
Roger Tweed, Ph.D.³
Gira Bhatt, Ph.D.³
Stephen Dooley, M.A.³
Nathalie Gagnon, LL.B., Ph.D.³

Journal of Abnormal Child Psychology

The final publication is available at Springer via <http://dx.doi.org/10.1007/s10802-016-0130-3>

Author Notes

¹ Simon Fraser University, 8888 University Drive, Burnaby, British Columbia, V5A 1S6

² Mid Sweden University, Holmgatan 10, Sundsvall, Sweden 851 70 SE

³ Kwantlen Polytechnic University, 12666 72 Avenue, Surrey, British Columbia, V3M 2M8

Correspondence regarding this article should be addressed to Catherine Shaffer, Department of Psychology, Simon Fraser University, 8888 University Drive, Burnaby, British Columbia, Canada V5A 1S6. Email: cshaffer@sfu.ca, Telephone: 778-782-3354, Fax: 778-782-3354

Abstract

The Antisocial Process Screening Device (APSD) is a well-supported tool for assessing psychopathic features in youth. However, most research with the APSD has been derived from clinical and forensic samples comprised mainly of male Caucasian and African American adolescents. In this prospective study, the incremental and predictive validity of the self-report APSD for violent and non-violent offending was examined in an ethnically diverse community sample of male and female youth ($N = 335$) aged 12 to 14. High-school students from a moderate sized city in Western Canada completed the self-report APSD and then completed the Self-Report of Offending 6 months later. Receiver Operating Characteristics analysis indicated that APSD total and subscale scores were predictive of violent and non-violent offending at 6-month follow-up with moderate to large effect sizes. In addition, total scores on the APSD added incremental predictive utility above and beyond traditional criminogenic predictors of youth offending (i.e., prior offending, delinquent peer affiliation, poor school achievement, substance use, low parental monitoring). Although sex differences emerged in the predictive utility of the Impulsivity subscale of the APSD vis-à-vis violent offending, sex did not moderate the relationship between APSD total, Narcissism, or Callous/Unemotional scores and offending. In addition, the predictive utility of the APSD did not vary as a function of the youth's ethnic background. These findings suggest that: (1) the self-report APSD may have utility for risk or threat assessment with normative school populations, (2) APSD findings from higher risk samples generalize to a lower risk sample of high-school youth, and (3) predictive utility of APSD total scores do not differ across male and female Caucasian and ethnic minority youth.

Keywords: Antisocial Process Screening Device, ethnicity, offending, sex differences, youth psychopathy

Incremental and Predictive Validity of the Antisocial Process Screening Device in a Community Sample of Male and Female Ethnic Minority and Caucasian Youth

The identification and characterization of subgroups of youth who engage in criminal activity has been a critical focus of researchers and policy makers in recent years. Although the developmental trajectory of antisocial youth is heterogeneous (Monahan, Steinberg, Cauffman & Mulvey, 2009), callous and unemotional (CU) traits (e.g., uncaring, lacking remorse or empathy), narcissism, and impulsivity have been useful in identifying a critical subset of youth who engage in persistent and severe antisocial behavior (Frick & Dickens, 2006).

CU traits, narcissism, and impulsivity show marked overlap with the affective, interpersonal, and behavioral symptoms of psychopathy (Frick, 2009), a personality disorder with a longstanding history in the adult psychopathology literature (Arrigo & Shipley, 2001) that is characterized by, *inter alia*, a lack of empathy, remorselessness, poor impulse control, and a grandiose sense of self (Cooke & Michie, 2001). Although diagnosing a youth with psychopathy is inappropriate (Forth, Kosson, & Hare, 2003), research has supported the idea that early manifestations of psychopathy in childhood and adolescence resemble manifestations of psychopathy in adulthood (e.g., Salekin, 2008). Moreover, identifying early features of psychopathy may be an important first step to linking youth to appropriate treatments (da Silva, Rijo, & Salekin, 2013). Indeed, over the past decade, there have been some significant advances in treatment for psychopathic features (e.g., Haas et al., 2011; McDonald, Dodson, Rosenfield, & Jouriles, 2011). Thus, screening psychopathic features might aid in treatment-planning and risk reduction efforts.

To this end, several instruments have been developed to measure psychopathic traits in adolescence. One such measure is the Antisocial Process Screening Device (APSD; Frick & Hare, 2001), a well-supported screening measure of psychopathy that was developed using the Psychopathy Checklist-Revised (PCL-R; Hare, 2003) as a model in terms of item content. The APSD contains three scales: Callous Unemotional (CU), Impulsivity (IMP), and Narcissism (NAR). Although the APSD can be administered by parents and teachers, a self-report version was also developed (Caputo, Frick, & Brodsky, 1999).

Self-report measures of psychopathy, such as the self-report APSD, have generated some controversy. On the one hand, self-report tools may lead to response bias, such as youth underreporting psychopathic features (Breuk, Clauser, Stams, Slot, & Doreleijers, 2007). On the other hand, some authors argue that self-report tools may potentially improve the detection of interpersonal and affective deficits that clinicians might overlook (Lilienfeld & Fowler, 2006). Also, unlike clinician rated tools, self-report tools are not negatively impacted by imperfect interrater reliability. Finally, compared to clinician rated measures of psychopathy, such as the Psychopathy Checklist: Youth Version (PCL:YV; Forth et al., 2003), self-report measures of psychopathy are less costly and time consuming to administer and do not require extensive training. Given these debates, it is particularly important to rigorously evaluate self-report tools such as the self-report APSD.

Thus far, scores on the self-report APSD have been found to have a moderate association with criminal and antisocial behavior (e.g., Salekin, Leistico, Neumann, DiCicco, & Duros, 2004; Spain, Douglas, Poythress, & Epstein, 2004). However, most research with the self-report

APSD has been derived from clinical and forensic samples comprised mainly of male Caucasian and African American adolescents. In addition, few studies have investigated the incremental predictive validity of cumulative scores on the self-report APSD in community samples when controlling for other known criminogenic factors associated with delinquent behavior. As result, it is unclear whether the self-report APSD is a useful screening measure for antisocial behavior in relatively low-risk community samples of ethnically diverse male and female adolescents.

Using data collected from 335 grade 8 and 9 high-school students in Western Canada, the current study was conducted to examine the incremental and predictive validity of the self-report APSD for violent and non-violent offending. In addition, this study examined whether sex moderated the relationship between APSD scores and offending, and whether the relationship between the APSD and offending differed across different ethnic groups.

Association between the APSD and Antisocial Behavior. Although it has been suggested that the APSD and PCL:YV do not measure the same latent construct (Lee, Vincent, Hart, & Corrado, 2004), the self-report APSD has demonstrated moderate associations with the PCL:YV (Murrie & Cornell, 2002) and comparable associations with violent and non-violent arrests in adolescent offender samples (Lee et al., 2003). At the factor-level, however, the association between APSD subscales and offending has been less consistent. In a sample of adjudicated youth, self-reported CU traits were only related to physical aggression whereas total, IMP, and NAR scores were moderately associated with both physical and verbal aggression (Spain et al., 2004). Moreover, for justice-involved juveniles, self-reported CU traits held the smallest and least consistent relationship with self-reported offending in comparison to total, IMP, and NAR scores (Poythress, Dembo, Wareham, & Greenbaum, 2006). However, these factor level differences were not present for the parent-rated APSD in a non-referred, community sample (Marsee, Silverthorn, & Frick, 2006). In offender samples, the CU subscale has demonstrated relatively poor internal consistency ($\alpha = .22 - .61$) in comparison to the IMP ($\alpha = .44 - .68$) and NAR ($\alpha = .59 - .85$) subscales (Poythress, Dembo, et al., 2006; Poythress, Douglas, et al., 2006; Muñoz & Frick 2007), which may explain the weak association between APSD measured CU traits and antisocial behavior.

Prospective research of the APSD in youth offenders and clinically-referred youth has also suggested that self-report APSD total scores are predictive of general recidivism (Douglas, Epstein, & Poythress, 2008; Falkenbach, Poythress, & Heide, 2003; Salekin, 2008) and institutional misconduct (Murrie, Cornell, Kaplan, McConville, & Levy-Elkon, 2004), but less predictive of violent recidivism (Douglas et al., 2008; Salekin, 2008). At the factor-level, the IMP and NAR subscales have demonstrated better predictive utility in comparison to CU traits for adjudicated youth (Douglas et al., 2008; Salekin, 2008). With respect to incremental validity, the APSD provided small but significant value above 14 other risk factors (e.g., age, sex, race, peer delinquency, substance use, school problems, past charges) in the prediction of general recidivism for detained youth (Salekin, 2008). However, the self-report APSD did not add incrementally to the prediction of violent recidivism. Similarly, Douglas and colleagues (2008) found that, in a sample of adjudicated youth, the self-report APSD did not add incrementally to the prediction of recidivism above other established risk factors (e.g., substance related disorder, conduct disorder). Thus, although the APSD seems to have predictive value among clinical and offender samples, findings suggest that incremental predictive validity may be limited.

Few studies have examined the predictive utility of the self-report APSD in community samples, and much of this work has focused specifically on CU traits rather than the entire APSD. Combined observer ratings of CU traits were predictive of proactive aggression (Kimonis, Frick, Fazekas, & Loney, 2006) and have been integral in identifying youth who were more likely to engage in severe and persistent patterns of delinquency (Frick, Stickle, Dandreaux, Farrell, & Kimonis, 2005). When evaluating observer-rated CU traits in isolation from the other subscales, it appears there is incremental value above other risk factors in community populations (Kimonis, Frick, Boris, et al., 2006; McMahon, Witkiewitz, & Kotler, 2010). Even fewer studies have been conducted on the entire APSD and its subscales in community samples. To our knowledge, there has been only a single examination of the incremental value of all the subscales of the self-report APSD in a community sample. In a relatively small sample ($n = 91$) of Caucasian and African-American youth who were recruited to over-sample youth with conduct problems and youth high on psychopathic traits, Muñoz and Frick (2007) found that NAR and IMP subscales were stronger predictors of aggressive and antisocial behavior than were CU traits. However, the predictive capability of the APSD subscales in this study was predominantly accounted for by previous antisocial behavior.

Sex, Ethnicity, and the APSD. Several authors have commented on the importance of the investigation of the potential moderating role of demographic characteristics on the association between youth psychopathic features and antisocial outcomes (e.g., McMahon et al., 2010). The APSD factor structure was not reproduced in an all-female offender sample (Colins, Bijttebier, Broekaert, & Andershed, 2014), and an Item Response Theory analysis suggested that the APSD subscales provided differing information for females in comparison to males (i.e., the CU factor provided more information for females than males; Dillard, Salekin, Barker, & Grime, 2013). It may be the case that CU traits manifest differently between girls and boys, therefore affecting the relationship between CU traits and antisocial outcomes. For instance, although the association between physical aggression and CU traits was equal across sex, studies have found that the relationship between CU traits and relational aggression was stronger for adjudicated females (Stickle, Marini, & Thomas, 2012) and non-referred female youth (Marsee et al., 2006). Nonetheless, several community studies have reported that sex does not moderate the relationship between APSD subscales and antisocial outcomes (Kimonis, Frick, Fazekas, et al., 2006; McMahon et al., 2010). While more research is needed, it appears that the effect of sex on the relationship between the APSD subscales and antisocial behavior is mixed in both offender and community samples.

Scholars have also urged a better understanding of the role of ethnicity in assessing psychopathy and the validity of pertinent measures in youth (Edens, Skeem, Cruise, & Cauffman, 2001). Edens and colleagues (2007) found that ethnicity moderated the relationship between behavioral components of the PCL:YV and violent recidivism. Specifically, a higher proportion of non-Caucasian youth in the sample was associated with a weaker relationship between the behavioral features of psychopathy and violent recidivism. However, this moderation did not exist for interpersonal and affective components of psychopathy (i.e., effect sizes were small and non-significant). When considering the APSD, there have been few studies examining the moderating effect of ethnicity on its predictive utility. Nevertheless, the initial findings have suggested that the relationship between APSD subscales and a variety of outcomes

have not differed across ethnicity (e.g., McMahon et al., 2010; Thornton, Frick, Crapanzano, & Terranova, 2013).

Purpose of the Present Study

The main purpose of the present study was to examine the utility of the APSD to predict offending in a community sample above and beyond common criminogenic factors: prior offending, delinquent peer affiliation, poor school achievement, substance use, and low parental monitoring. These risk factors were selected given their robust associations with offending in community, clinical, and forensic samples (e.g., Farrington, 1998; Loeber & Hay, 1997; Mulder, Brand, Bullens, & Van Marle, 2010).

Rationale for the current study stems from the dearth of empirical studies examining the predictive utility of the entire APSD (i.e., not just CU traits) in a so-called normative sample (i.e., non-clinically referred youth). Additionally, only a handful of studies have tested the incremental value of the APSD, and these were conducted in clinical samples (e.g., Douglas et al., 2008; Salekin, 2008) or in a high-risk sample of non-referred youth (Muñoz & Frick, 2007). Thus, to our knowledge, this is one of the first studies to have examined the predictive and incremental validity of the full self-report APSD in a relatively low-risk community sample. Given the growing use of the psychopathy construct and its measures in youth legal-decision making (Viljoen, MacDougall, Gagnon, & Douglas, 2010) and risk assessment (Viljoen, McLachlan, & Vincent, 2010), it is important to understand if the APSD is generalizable across a variety of populations and contexts. Moreover, it is critical to investigate the incremental value of the APSD, so clinicians and policy-makers can decide the correct weight that should be given to the instrument in the assessment and management of adolescent offending. On the basis of previous findings (e.g., Douglas et al., 2008; Muñoz & Frick, 2007; Poythress, Dembo, et al., 2006; Salekin, 2008), we hypothesized that APSD Total, IMP, and NAR scales would have better predictive utility than the CU scale, and that APSD Total scores would add incrementally to the prediction of offending beyond other risk factors.

We also examined the potential moderating effect of sex on the predictive utility of the APSD, a research avenue requiring more empirical scrutiny given its inconsistent pattern of findings. We hypothesized small sex differences would exist in the relationship between the APSD, its factors, and offending. However, given the mixed nature of these findings, it was challenging to provide a priori hypotheses on the direction of these differences. In a similar line of questioning, we examined the role of ethnicity in the predictive utility of the APSD in a diverse sample consisting of multiple distinct ethnic groups. Studies have typically examined differences in the APSD between Caucasians and an “Other” category; however, we investigated this research question using an expanded number of categories (i.e., differences across South Asian, Asian, Caucasian, and other ethnic minority youth), thereby allowing for more precise definitions of ethnicity. Further, previous studies (e.g., Muñoz & Frick, 2007) have typically consisted of samples comprised largely of Caucasian and African-American youth (but see e.g., Lee et al., 2003); however, in the current study a large proportion of South Asian and Asian youth were included. Extrapolating from previous meta-analytic findings (e.g., Edens, Campbell, & Weir, 2007), we hypothesized that there would be a weaker association between APSD scores and offending in ethnic minority youth compared to Caucasian youth.

Method

Participants and Procedure

Within a moderate sized and ethnically diverse city in Western Canada, public school students enrolled in the eighth and ninth grade were provided with recruitment materials advertising the details of the study. Youth could participate if their parents/guardians provided consent and the youth provided assent. Once permission to participate had been received, youth completed a series of self-report questionnaires, including the self-report APSD, in their high-school classrooms. Approximately 6 months after the initial assessment, youth completed a series of follow-up questionnaires, including a self-report measure of offending behavior. If youth had difficulty reading the questionnaires, research assistants were available to read the inventories or clarify items.

Of the 686 youth invited to participate, 60.8% ($n = 417$) of youth participated in the study. Participation attrition from baseline to follow-up was 16.1% ($n = 67$). Of the youth with complete follow-up information, 2.0% ($n = 7$) had missing APSD information (i.e., five or more unanswered items on the total scale) and were therefore removed from subsequent analyses. In addition, 13.4% ($n = 45$) of the sample did not provide information regarding their ethnic background, 2.7% ($n = 9$) school failure, 0.3% ($n = 1$) sex, or 0.3% ($n = 1$) prior offending. These cases were retained for analysis, with the exception of analyses that included these variables as predictors.¹ The final sample was comprised of 335 high-school youth (149 males and 185 females). The ages of the youth ranged between 12 and 14 years ($M = 13.07$, $SD = 0.39$). Of the sample, 39.7% ($n = 133$) described themselves as South Asian, 19.7% ($n = 66$) as Asian, 14.9% ($n = 50$) as European/Caucasian, 3.6% ($n = 12$) as Aboriginal, 2.1% ($n = 7$) as African-Canadian, 2.4% ($n = 8$) as Latin Canadian, and 4.2% ($n = 14$) as another ethnic minority group². The ethnic composition of the sample replicated regional trends. Due to the small sample sizes of Aboriginal, African-Canadian, and Latin Canadian ethnic minority groups included in the study, these groups were collapsed into a single category (i.e., “Other” ethnic minority group, $n = 41$) for analysis.

Measures

Self-Report APSD. The self-report APSD is a 20-item scale that measures psychopathic features in youth aged 6 to 13 years old. It includes three subscales: Impulsivity (IMP; five items; “I do not plan ahead or leave things until the last minute”), Narcissism (NAR: seven items; “I am charming or nice to get things I want”), and Callous/Unemotional traits (CU; six items, “My emotions are shallow and fake”). Originally, a two-factor model of the self-report APSD was suggested (Frick, O’Brien, Wootton, & McBurnett, 1994); however, studies have

¹ Several analyses were conducted to determine whether there were any differences between youth with complete information and youth with missing follow-up, APSD, ethnicity, or school failure variables with respect to demographic characteristics or the major study variables under investigation. Compared to youth with complete information, youth with missing follow-up data were significantly older, $t(78.61) = 4.12$, $p < .001$, Cohen’s $d = 0.61$, youth with missing ethnicity information had higher rates of school failure, $\chi^2(1) = 8.44$, $p = .004$, $\phi = 0.15$, and self-reported violent offending at the 6-month follow-up, $U = 7505$, $p = .01$, $r = .14$, and youth with missing school failure information had lower rates of delinquent peer affiliation, $t(83.17) = -1.37$, $p = .002$, Cohen’s $d = 0.65$. No other differences were significant.

² Although Caucasian youth are technically an ethnic minority group in the current sample, in this paper the term ethnic minority was used to refer to any youth that were non-Caucasian.

provided support for the aforementioned three-factor structure using Confirmatory Factor Analysis (Frick, Bodin, & Barry, 2000; Vitacco, Rogers, & Neumann, 2003). Item content was modeled after the PCL-R except for several items with no clear analogue for youth (i.e., sexual promiscuity). In contrast to the PCL-R, there is no established threshold on the APSD for the classification of adolescents with high psychopathic traits, although some researchers have used cut-off scores of 20 (Marsh et al., 2008) or 25 (Budhani & Blair, 2005) to classify youth. All questions on the APSD were answered on a 3-point scale that reflects whether the item is *not at all true* (0), *sometimes true* (1), or *definitely true* (2). APSD total scores have demonstrated acceptable validity and reliability ($\alpha = .62 - .81$; Barry, Frick, & Killian, 2003); however, the internal consistency at the factor level has been less adequate: CU ($\alpha = .22 - .61$); IMP ($\alpha = .44 - .68$); NAR ($\alpha = .59 - .85$) (Muñoz & Frick 2007; Poythress, Dembo, et al., 2006). Consistent with previous research (e.g., Lee et al., 2003; Poythress, Douglas, et al. 2006, Poythress, Dembo, et al., 2006), the current study found that internal consistency was acceptable for the APSD total score ($\alpha = .73$) and weaker for the factor scores ($\alpha = .51, .63$, and $.44$ for IMP, NAR, and CU subscales, respectively).

Delinquent Peer Affiliation. Delinquent peer affiliation was assessed through the use of the Delinquent Peers Scale (Thornberry, Lizotte, Krohn, Farnworth & Jang, 1994), an eight-item scale measuring the proportion of the youth's friends that are involved in various types of delinquent behaviors (e.g. theft, assault). An additional item measuring peer gang-affiliation was also included bringing the total number of items to nine. Responses were given on a 4-point scale, with responses ranging from *none of them* (0) to *most of them* (3). Research has reported a moderate association between scores on the DPS and offending ($r = .47$, Thornberry et al., 1994). In the current sample, the Delinquent Peers scale had an internal consistency of $.78$.

Poor School Achievement. Poor school achievement was examined using youths' responses to the following question: "How often do you get failing grades on school work?" Youth responded *never* (0), *sometimes* (1), or *a lot* (2). However, due to small sample size, youth who responded *a lot* (0.6%, $n = 2$) and youth who responded *sometimes* (20.0%, $n = 67$) were collapsed into a single category.

Substance Use. Substance use was examined using the Drug and Alcohol Use-Teen Conflict Survey (Bosworth & Espelage, 1995), a six-item scale that examines substance use over the past month. Responses were given on a 5-point scale, ranging from *never* (0) to *five or more times* (4). The Drug and Alcohol Use-Teen Conflict Survey had an internal consistency of $.74$ in the sample.

Parental Monitoring. Parental Monitoring was examined using the Parental Monitoring Scale (Ramirez, Crano, Quist, Burgoon, Alvaro & Grandpre, 2004), which consists of three items asking youth to indicate if they had at least one parent, relative, or guardian who knew where the youth was, who the youth was with, and what the youth was doing when they were not at home. Responses were coded on a 3-point scale from *not at all true* (0) to *very much true* (2). Studies have found a moderate association ($r = -.20$ to $.38$) between scores on the Parental Monitoring Scale and offending behavior (Neumann, Barker, Koot, & Maughan, 2010). In the current sample, internal consistency was $.78$.

Offending. Youth offending was assessed using the Self-Report of Offending (SRO; Huizinga, Esbensen, & Weiher, 1991) that was completed at the baseline and 6-month follow-up assessments. The SRO is a 24-item tool that examines involvement in different types of criminal activities and can be broken down into subscales related to violent (10 items) and non-violent offenses (14 items). For each item, respondents answered *yes* (1) or *no* (0) as to whether they had engaged in the offending behavior over the previous 6-month period. Two sex-related items of the SRO (“Have you paid someone to have sex with you?” and “Have you forced someone to have sex with you?”) and whether the youth had killed someone were excluded from data collection due to concerns about the appropriateness of these items given the age of the participants. The SRO has displayed good reliability and validity (Knight, Little, Losoya, & Mulvey, 2004) and has produced results consistent with official measures of delinquency (Chung & Steinberg, 2006). Because the SRO was comprised of dichotomous (yes/no) items, scale reliability was calculated using tetrachoric ordinal alphas (see Gadermann, Guhn, & Zumbo, 2012). In the current sample, the SRO total score had an internal consistency of .73 and .94 at the baseline and follow-up assessments, respectively. SRO total scores were significantly positively skewed and could not be normalized through log plus one or Box-Cox transformations. As such, non-parametric tests were used when examining self-reported violent and non-violent offending in subsequent analyses.

Results

Descriptive Statistics and Sex/Racial Differences in APSD Scores and Offending

Descriptive statistics of the APSD, demographic control variables, and the common criminogenic factors that were used as covariates, and self-reported violent³ and non-violent offending are presented in Table 1. To examine whether there were any sex or racial/ethnic differences in APSD scores and offending *t*-tests, *F*-tests, Mann Whitney U tests, and Kruskal Wallis tests were conducted. Female youth scored significantly lower on the CU subscale ($M = 2.71$, $SD = 1.57$) compared to their male peers ($M = 3.24$, $SD = 1.90$), $t(281.86) = 2.73$, $p = .007$, although the difference was small (Cohen’s $d = 0.31$). Differences between male and female youth on total ($p = .05$, Cohen’s $d = 0.22$), IMP ($p = .169$, Cohen’s $d = 0.15$) and NAR scores ($p = .796$, Cohen’s $d = 0.03$) of the APSD were small and not significant. There were no significant differences between ethnic groups on total ($p = .464$, $\eta_p^2 = .01$), IMP ($p = .328$, $\eta_p^2 = .01$), NAR ($p = .138$, $\eta_p^2 = .02$), and CU subscales ($p = .135$, $\eta_p^2 = .02$).

With respect to offending, there were no significant differences in the number of self-reported non-violent offenses between male and female youth ($p = .704$, $r = .02$). However, males had a significantly higher number of violent offenses (Mean rank = 181.61) compared to females (Mean rank = 156.13), $U = 11679.5$, $p = .001$, $r = .19$. The number of self-reported violent ($p = .383$, $\eta^2_H = .00$) and non-violent offenses ($p = .323$, $\eta^2_H = .00$) did not significantly

³ The most frequently reported violent offense was having been in a fight (17.7%, $n = 59$). Given that participating in a fight may not necessarily be an offence (especially when fighting is in self-defense), one concern was that the inclusion of this SRO item may have inflated the rate of violent offending in the sample. Analyses were run with and without this item. Bivariate and predictive validity analyses did not significantly change as a function of this item. However, incremental validity analyses revealed that the incremental effects of psychopathic features disappeared.

differ as a function of whether the youth was South Asian, Asian, Caucasian, or a member of another ethnic minority group.

--Insert Table 1 about here--

Association between the APSD, Common Criminogenic Factors, and Offending

Pearson's product moment correlation and Spearman's rho correlation analyses were conducted to evaluate whether the APSD and common criminogenic factors were related to offending at the 6-month follow-up, independent of the other variables (see Table 1). APSD total and subscale scores were significantly positively associated with violent ($r_s = .18$ to $.32$, $p < .001$ to $.001$) and non-violent offending ($r_s = .16$ to $.36$, $p < .001$ to $.004$) at the 6-month follow-up. Youth with higher levels of parental monitoring were significantly less likely to engage in violent ($r_s = -.20$, $p < .001$) and non-violent offending ($r_s = -.30$, $p < .001$) as well as have lower total and subscale scores on the APSD ($r = -.48$ to $-.27$, $p < .001$). In addition, youth with prior offending, delinquent peer affiliation, and substance use were significantly more likely to engage in violent ($r_s = .22$ to $.42$, $p < .001$) and non-violent offending ($r_s = .28$ to $.36$, $p < .001$) and score higher on the total, IMP, and NAR subscales of the APSD ($r = .24$ to $.41$, $p < .001$). School failure was associated with violent ($r_s = .21$, $p < .001$) and non-violent offending ($r_s = .21$, $p < .001$), as well as APSD Total, IMP and CU traits ($r = .15$ to $.16$, $p = .004$ to $.008$). No other associations between the APSD, common criminogenic factors, and offending were significant.

Predictive Validity of the APSD

In order to investigate the predictive validity of the APSD, the area under the curve (AUC) of the Receiver Operating Characteristic (ROC) was produced for APSD total and subscale scores. One advantage of ROC analysis is that it is less sensitive to base-rate levels relative to other statistics, such as correlations, meaning that it is appropriate for relatively low base events such as offending (Rice & Harris, 2005). The AUC of the ROC graph can be taken as an index for interpreting the overall predictive accuracy of an instrument (i.e., the probability that a randomly selected youth who offended at the 6-month follow-up will have a higher APSD score than a randomly selected youth who did not offend at the 6-month follow-up). AUC values can range from 0 (perfect negative prediction), to .50 (chance prediction), to 1.0 (perfect positive prediction; Swets, Dawes, & Monahan, 2000).

In the current study, the base rate of violent and non-violent offending at the 6-month follow-up was 20.6% ($n = 69$) and 17.6% ($n = 59$), respectively. For violent offending, AUCs were .72 (95% CI [.65, .79], $r_{pb} = .32$, $p < .001$), .69 (95% CI [.62, .76], $r_{pb} = .29$, $p < .001$), .64 (95% CI [.57, .71], $r_{pb} = .21$, $p < .001$), and .63 (95% CI [.55, .70], $r_{pb} = .18$, $p = .001$) for the total, IMP, NAR, and CU scales, respectively. For non-violent offending, AUCs were .76 (95% CI [.70, .82], $r_{pb} = .35$, $p < .001$), .72 (95% CI [.65, .79], $r_{pb} = .32$, $p < .001$), .69 (95% CI [.62, .76], $r_{pb} = .25$, $p < .001$), and .61 (95% CI [.54, .69], $r_{pb} = .13$, $p = .007$) for the total, IMP, NAR, and CU scales, respectively. Overall, AUC values of total and subscale scores ranged from moderate to large (Rice & Harris, 2005).

As a further test of the predictive accuracy of the APSD, sensitivity (i.e., the conditional probability that a youth who offended at the 6-month follow-up would score high on the APSD),

specificity (i.e., the conditional probability that a youth who did not offend at the 6-month follow-up would score low on the APSD), positive predictive power (PPP; i.e., the proportion of youth with high APSD scores who offended at the 6-month follow-up), and negative predictive power (NPP; i.e., the proportion of youth with low APSD scores who did not offend at the 6-month follow-up) were calculated (see Table 2). In general, as sensitivity increases, specificity decreases and vice-versa (Metz, 1986). Because cut-scores of 20 and 25 resulted in few participants having high levels of psychopathic traits ($n = 7$ and 0 , respectively) we defined, for the various classification analyses, high APSD scores as youth who scored at or above the 25th, 50th, 75th, 90th, and 95th percentiles of the APSD score distribution. This generated cut-off scores of 6, 9, 12, 15, and 17 on the APSD, respectively. As shown in Table 2, more liberal APSD cut-off scores of 6, 9, and 12 generated low specificity and PPP, but high values for sensitivity and NPP (Van Belle, Fisher, Heagerty, & Lumley, 2004). In contrast, more conservative APSD cut-off scores of 15 and 17 generated low sensitivity and NPP, but high values for specificity and PPP.

--Insert Table 2 about here--

Do APSD Total Scores Add Incrementally to the Prediction of Offending?

To assess the incremental predictive validity of the APSD over other known risk factors for violent and non-violent offending, hierarchical Poisson and Negative Binomial regression analyses were conducted in *R* (Zeileis, Kleiber, & Jackman, 2007), which has increased capacities to test incremental effects (see R Core Team, 2014). The employment of Poisson or Negative Binomial regression is the recommended approach for modeling highly skewed count data and provides more accurate modeling estimates than standard Ordinary Least Squares regression (Gardner, Mulvey, & Shaw, 1995). Prior to conducting analyses, self-reported violent and non-violent offenses were examined to determine if overdispersion was present (i.e., a high proportion of zero responses causing the variance to be greater than the mean of each distribution). Overdispersion tests indicated that non-violent ($z = 2.42$, $p = .008$) but not violent offending ($z = 0.46$, $p = .324$), had a high proportion of zero responses, thus non-violent offending was accommodated using Negative Binomial models whereas Poisson models were used for violent offending. Multicollinearity among the predictors was assessed using tolerance values and Variance Inflation Factor (VIF) scores. Tolerance values (0.59 – 0.96) and VIF scores (1.05 – 1.70) were within acceptable limits (see Stevens, 1984) indicating that multicollinearity would not be an issue in these analyses.

In the first set of regressions, demographic control variables (i.e., age, sex, and ethnicity)⁴ and common criminogenic factors were entered in block one and APSD total scores were entered in block two (see Table 3).⁵ As shown in Table 3, adding psychopathic features to the violent and non-violent offending models provided incremental predictive utility over the demographic control variables and criminogenic factors in the model. In general, as reflected by the incident rate ratios, for every one unit increase in APSD total score there was an 11.0% and 18.0%

⁴ To represent ethnicity, three dummy variables were created using South Asian as the reference category: Asian (1 = yes, 0 = no); Caucasian (1 = yes, 0 = no); and 'Other' ethnic minority (1 = yes, 0 = no).

⁵ A priori power analyses using G*Power 3.1 (Faul, Erdfelder, Bunchner & Lang, 2009) indicated that a sample size of 335 was sufficient to detect small to large main and incremental effects in Poisson/Negative binomial regression models with 11 predictors with a power of .80, and an alpha of .05, two-tailed.

increase in the rate of self-reported violent and non-violent reoffending respectively, controlling for other variables.⁶

--Insert Table 3 about here--

To rule out the possibility of APSD total scores obscuring meaningful subscale differences, incremental predictive validity of APSD subscales was also evaluated. In the second set of regression analyses, demographic control variables and common criminogenic factors were entered in block one and IMP, NAR, and CU subscale scores were simultaneously entered in block two to examine the incremental validity of the APSD subscales above and beyond the block one variables. Overall, minimal differences in predictive power were observed when subscale scores were entered in block two in place of APSD total scores. Adding IMP, NAR and CU subscale scores to the violent, $\chi^2(13) = 106.25, p < .001, \Delta \chi^2(3) = 11.19, p = .011$, and non-violent, $\chi^2(13) = 101.68, p < .001, \Delta \chi^2(3) = 24.55, p < .001$, offending models provided incremental predictive utility over the control variables and criminogenic factors. Specifically, IMP, Exp (B) = 1.20, 95% CI [1.01, 1.42] $p = .041$, and CU, Exp (B) = 1.22, 95% CI [1.04, 1.42] $p = .014$, but not NAR subscale scores, Exp (B) = 1.04, 95% CI [0.92, 1.16], $p = .558$, were uniquely predictive of the incident rate of violent offending. In addition, IMP, Exp (B) = 1.31, 95% CI [1.06, 1.62], $p = .013$, and CU, Exp (B) = 1.28, 95% CI [1.06, 1.54], $p = .012$, but not NAR subscale scores, Exp (B) = 1.08, 95% CI [0.93, 1.25], $p = .298$, were uniquely predictive of the incident rate of non-violent offending over and above their shared variance.⁷

Does the Predictive Utility of the APSD Vary Across Sex and Ethnicity?

To test whether sex or ethnicity moderated the relationship between APSD scores and offending, a series of Poisson and Negative Binomial regression analyses was performed. To examine moderation effects after shared variance of the demographic and criminogenic factors was removed, demographic and criminogenic factors found to be significantly associated with offending in the incremental validity analyses (see Step 2 of Table 3) were controlled for in these analyses.⁸ Following the guidelines of Baron and Kenny (1985), moderation effects were tested for by entering control variables, APSD score, and sex/race in the first block of a Poisson/Negative Binomial regression model followed by their cross-product term in the second block of the analysis.⁹ Before the regression analyses were run, APSD total and subscale scores were mean-centered around zero. This helped reduce nonessential multicollinearity among the predictors and the interaction terms in the model. To further probe significant interactions,

⁶ Given the potential for criterion contamination between the baseline measure of substance use and the substance abuse item on the SRO (e.g., did you drive while drunk or high?), regression analyses were run with and without this item. Analyses did not significantly change as a function of this item.

⁷ We also analyzed the relationship between APSD scores and the occurrence of the combination of violent or non-violent offense (i.e., “any offense”) at the 6-month follow-up using bivariate, multivariate regression, and ROC analyses. The results of these analyses were highly similar to both violent and non-violent offending. These results are available from the lead author upon request.

⁸ A priori power analyses in STATA (StataCorp. 2011) indicated that the minimum detectable incident rate ratio for the cross-product terms in the violent and non-violent offending models after controlling for first ordered effects were 1.60 and 2.21, respectively.

⁹ To test the moderating effects of ethnicity each of the dummy categories created in the previous analysis and APSD score were entered in step 1, followed by cross-product terms between each dummy category and APSD score in step 2.

simple slopes for each of the interactions were plotted and examined separately for each gender/ethnic group, using two standard deviations above the mean to represent high APSD total and subscale scores and two standard deviations below the mean to represent low APSD total and subscale scores.

Moderation analyses indicated that there were no significant differences in APSD total, NAR, or CU scales in predicting the incident rate of violent, $\text{Exp (B)} = 0.89$ to 1.03 , $p = .179$ to $.489$, or non-violent offending across male and female youth, $\text{Exp (B)} = 0.86$ to 1.01 , $p = .15$ to $.913$. In addition, there were no significant differences in IMP scores in predicting the incident rate of non-violent offending, $\text{Exp (B)} = 0.93$, $p = .095$. However, sex significantly moderated the relationship between IMP and violent offending, $\text{Exp (B)} = 1.60$, 95% CI [1.20, 2.14], $z = 3.16$, $p = .002$; $\Delta \chi^2 (6) = 31.47$, $p < .001$. As shown in Figure 1, males with high IMP scores had a significantly higher rate of self-reported violent offending compared to males with low IMP scores, but IMP scores were not related to self-reported violent offending in females. With respect to the youths' ethnic background, ethnic background did not significantly moderate the relationship between APSD total or subscale scores and violent, $\text{Exp (B)} = 0.93$ to 1.55 , $p = .097$ to $.936$ or non-violent offending, $\text{Exp (B)} = 0.53$ to 1.22 , $p = .077$ to $.871$.¹⁰

Discussion

The main purpose of the present study was to examine the incremental and predictive validity of the self-report APSD for violent and non-violent offending in a community-based sample of high-school youth. Both bivariate and ROC analyses demonstrated that APSD total and subscale scores were significantly predictive of prospective self-reported violent and non-violent offending. In general, slightly larger effect sizes were observed for APSD total scores compared to the IMP, NAR, and CU subscales. Consistent with previous longitudinal studies with clinical, forensic, and community samples (e.g., Douglas et al., 2008; Muñoz & Frick, 2007; Poythress, Dembo, et al., 2006; Salekin, 2008), the IMP and NAR subscales had stronger associations with violent and non-violent offending in comparison to the CU subscale. These small to moderate effect sizes ($r_{pb} = .13 - .35$) were commensurate with meta-analytic findings between the clinician-rated PCL:YV and offending (see Edens et al., 2007). APSD total scores had incremental utility for violent and non-violent offending above demographic control variables, prior offending, delinquent peer affiliation, poor academic achievement, substance use, and low parental monitoring. Thus, in contrast to findings with clinical and offender samples (e.g., Douglas et al., 2008; Salekin, 2008), the APSD evidenced incremental utility in a community sample of adolescents.

Higher cut-off scores on the APSD (e.g., 15 and 17) demonstrated higher values for specificity and PPP compared to lower cut-off scores (e.g., 6, 9, and 12) for the prediction of violent and non-violent offending, respectively. However, some values for PPP were under 50% suggesting that rates of false positives were relatively high. For screening purposes, some authors have argued that a greater emphasis should be placed on the over-identification of higher risk youth, even at the expense of falsely identifying some lower risk youth (Murrie & Cornell, 2002). Although additional research is needed on appropriate cut-off scores on the APSD to

¹⁰ Several interactions trended towards significance for violent offending: Other Ethnic Group \times APSD Total, $\text{Exp (B)} = 1.16$, 95% CI [1.00, 1.35], $p = .05$, and Other Ethnic Group \times CU, $\text{Exp (B)} = 1.55$, 95% CI [0.92, 2.59], $p = .097$. For non-violent, Asian \times IMP trended towards significance, $\text{Exp (B)} = 0.53$, 95% CI [0.27, 1.07], $p = .077$.

maximize classification accuracy, findings from the current study suggest that the self-report APSD may be useful in distinguishing between low- and high-risk youth. In particular, the APSD may serve as a useful screening device for the identification of potentially higher risk adolescents who require more in-depth evaluation not only of psychopathic traits (i.e., vis-à-vis administration of the PCL:YV) but of risk more broadly.

A secondary aim of the current study was to examine whether the APSD had differential predictive utility for males and females. As the authors of the APSD intended the scales to be relevant to both male and female youth, examining whether or not the relationship between scores on the APSD and offending may be stronger for one sex compared to another is of particular value. Although previous studies have suggested sex differences with respect to the relationship between CU traits and offending (e.g., Colins et al., 2014; Vaughn, Newhill, DeLisi, Beaver, & Howard, 2008), no evidence for this association was found in the current study. Further, in line with previous studies of community samples (Kimonis, Frick, Fazekas, et al., 2006; McMahan et al., 2010), sex did not moderate the relationship between offending and the APSD total or NAR scores. However, results suggested sex differences in the relationship between IMP and violent offending. Although it is unknown why impulsive traits had a stronger association with violent offending in males compared to females, one possibility is that impulsivity manifests differently across sex. Males who are impulsive may be more likely to engage in externalizing types of behaviors (see e.g., Baker & Yardley, 2002), such as violence towards others, compared to females. This could also explain differences in the level of violent offending across sex observed in the sample. Another possibility is that this is the result of differential parenting practices. Parents may be more likely to monitor their daughters' behavior more than their sons (Bottcher, 1995). Further, parents may be more likely to accept delinquent behavior on behalf of their sons than their daughters (Fagan, Van Horn, Hawkins, & Arthur, 2007). Females who display impulsive behavior may be monitored and supervised more closely than males (Bottcher, 1995), thereby limiting their opportunity to engage in violence. A final possibility is that due to sex differences in the acceptability in violent behavior, impulsive females may be more likely to under-report involvement in violence, thereby resulting in the observed sex differences in the association between impulsivity and violent behavior. Although more research is needed, findings of the current study suggest predictions of violent conduct based on the IMP scale should be interpreted more cautiously for females.

One area that has not been fully examined is whether there are ethnic differences in the predictive utility of the APSD. Thus, this study also explored whether ethnicity moderated the association between APSD scores and offending. The moderating effect of ethnicity is an important issue because if measures of psychopathic features are less accurate for particular ethnic minority groups, caution in the use of such measures for risk assessment would be warranted. Although some studies have suggested small ethnic differences in the relationship between psychopathic features and reoffending (e.g., Edens et al., 2007), in line with previous studies of the APSD (e.g., McMahan et al., 2010; Thornton et al., 2013), the relationship between APSD scores and antisocial behavior did not vary as a function of whether youth were South Asian, Asian, Caucasian, or another ethnic minority status. These findings suggest that the APSD may be a suitable instrument as part of assessing risk and treatment needs amongst diverse ethnic groups, although additional research on this topic certainly is warranted.

Overall, the results from the current study demonstrate the utility of the self-report APSD in predicting antisocial behavior among an ethnically diverse community sample of male and female youth. However, it is important to note six limitations that may impact internal validity of the study and generalizability of the findings. First, although APSD total scores had acceptable internal consistency, these values were low for the IMP, NAR, and CU subscales which may have resulted in a weaker association between the subscale scores and self-reported offending. This might explain why total APSD scores had larger AUC values for offending, compared to the subscale scores. As such, the APSD may need to be revised in order to reliably assess individual symptom clusters of psychopathy (e.g., have weak items removed or additional items added). To some extent this has been accomplished for the measurement of CU traits with the self-report Inventory of Callous-Unemotional Traits (ICU; Essau, Sasagawa & Frick, 2006), a measure consisting of 24-items. However, this has not been done for the other dimensions covered by the APSD. Problems with the factor structure and internal consistency of some of the ICU subscales have also raised questions about the validity of the ICU (e.g., Essau et al., 2006; Kimonis et al., 2008). Nevertheless, one study conducted by Ansel and colleagues (2014) found that the ICU demonstrated higher internal consistency and stronger correlations with delinquent behavior than the CU subscale of the APSD.

Second, this study relied solely on a youth self-report measure of offending. Although this is a valid approach to examine offending and youth may self-report more offending than what official records show (Krueger et al., 1994), it is possible that measurement error was introduced for the included self-report instruments. For example, the youth scoring high on symptoms of psychopathic features may have been susceptible to lying about their involvement in antisocial activities (Laajasalo et al., 2014), thereby underestimating the true base rate of offending. In addition, observed effect sizes, particularly for the IMP and NAR subscales, may have been inflated due to the use of a mono mode of assessment of psychopathic features and offending (i.e., use of self-report data only). However, given that prior studies with observer-rated versions of the APSD (e.g., Marsee et al., 2006) have yielded a similar pattern of findings to those obtained in the current study, the relationship between the self-report APSD and offending does not appear to primarily reflect the reliance on self-report measures. Nevertheless, identifying offending on the basis of information from collateral sources (e.g., parents, teachers, juvenile arrest records) may also be helpful in providing a more accurate indication of offense rates and controlling for potential effect size inflation.

Third, a relatively small number of covariates were included in the incremental predictive validity analyses. As such, it remains unclear whether the APSD has predictive utility above and beyond a broader array of risk factors for violent and antisocial behavior. For instance, several review articles have indicated that neuropsychological deficits, peer rejection, family dysfunction, and neighborhood disorganization are important predictors of youth offending (Dodge & Pettit, 2003; Loeber & Farrington, 2000). Future studies should be conducted to examine whether the APSD adds incrementally to the prediction of antisocial behavior once these other variables are considered.

Fourth, given that the minimal detectable incident rate ratios for the cross-product terms in the violent and non-violent offending models were 1.60 and 2.21, respectively, analyses may have been underpowered to detect significant moderation effects and some sex/ethnic differences

in the predictive utility of the APSD may be obtained with a larger sample. Fifth, in the current study, the ‘Other’ ethnic minority group was treated as a whole, despite consisting of at least three different ethnic groups (e.g., Aboriginal, African-Canadian, Latin Canadian youth). Although sample size did not permit examining differences in the predictive utility of the APSD for these different groups, future research should examine whether the APSD is also effective among specific ethnic groups. Until then, findings from this group should be tempered with respect to their application to ethnic groups incorporated in this category. In addition, the current study did not examine issues of identity, culture, or other variables (e.g., socioeconomic status) that could account for ethnic differences. Future research should be conducted to examine the association between the APSD across ethnicity controlling for these variables. Although beyond the scope of the current paper, future research should also be conducted to confirm the factor structure of the APSD across the various ethnic groups included in the study. Mean-level differences and differences in the predictive validity of the APSD were not observed in South Asian, Asian, Caucasian, and other ethnic minority youth, however there may be differences in how items and factors load across cultures which were not captured at a group-level analysis. This may also be true with respect to sex. Thus, future studies should be conducted to examine configural, metric, and scalar invariance across these subgroups.

Finally, in contrast to previous studies with community adolescents (e.g., Marsee et al., 2006), the sample used in the current study was characterized by more violent (20.6%) than non-violent antisocial behavior (17.6%) due to the inclusion of the “having been in a fight” item on the violent offending scale of the SRO. Among high school students, the prevalence of physical fighting can be as high as 31.5% (Swahn, Bossarte, Palmier, & Yao, 2013). As such, including this item may have produced a higher base rate of violent offending compared to some other studies. Moreover, although bivariate analyses did not vary as a function of this item and the APSD demonstrated a robust predictive association with violent offending, the APSD did not add incremental utility to the prediction of violent offending when this item was removed. Nonetheless, getting into fights is an important behavior with respect to social policy and health, and hence warrants inclusion in the criterion of violence. Despite this, findings regarding the incremental utility of the APSD should be interpreted cautiously.

Despite the abovementioned limitations, the present study contributes to this research area in several important ways. The present study is one of the first to examine the incremental predictive validity of APSD total scores in a community sample. Findings highlight the importance of identifying youth with psychopathic traits when assessing level of risk. Further, the characteristics of the sample demonstrate that APSD findings from higher risk samples generalize to a lower risk sample of high-school students. The current findings also add to the growing literature suggesting that the APSD, with the exception of the IMP subscale, may be equally accurate in capturing antisocial tendencies for both males and females. Studies of the APSD have been conducted with predominately Caucasian and African-American samples, however this study is one of the first to demonstrate that the APSD may be cross-culturally valid for South Asian and Asian youth. Although more research is needed with respect to the utility of the APSD in normative samples of male and female youth from diverse ethnic backgrounds, the APSD could be used as part of an assessment battery for youth about whom there is concern of risk for violence.

Acknowledgements

This research was supported by an operating grant from the Social Sciences and Humanities Research Council of Canada-Community University Research Alliance (SSHRC – CURA). The views expressed herein are those of the authors and do not necessarily reflect the views or policies of the agency that funded the research. The authors gratefully acknowledge the assistance of the Acting-Together SSHRC - CURA community partners and research assistants. In addition, we thank the three anonymous reviewers whose comments helped improve and clarify this manuscript.

Ethical Standards

Ethical approval to conduct this study was granted by the Research Ethics Boards of the pertinent universities and school authorities.

Conflict of Interest

The authors declare that they have no conflict of interest.

References

- Ansel, L. L., Barry, C. T., Gillen, C. T., & Herrington, L. L. (2014). An analysis of four self-report measures of adolescent callous-unemotional traits: Exploring unique prediction of delinquency, aggression, and conduct problems. *Journal of Psychopathology and Behavioral Assessment*. Advance online publication, 1-10. doi: 10.1007/s10862-014-9460-z
- Arrigo, B. A., & Shipley, S. (2001). The confusion over psychopathy (I): Historical considerations. *International Journal of Offender Therapy and Comparative Criminology*, *45*, 325-344. doi: 10.1177/0306624X01453005
- Baker, J. R., & Yardley, J. K. (2002). Moderating effect of gender on the relationship between sensation seeking-impulsivity and substance use in adolescents. *Journal of Child & Adolescent Substance Abuse*, *12*, 27-43. doi:10.1300/J029v12n01_02
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*, 1173-1182. doi: 10.1037/0022-3514.51.6.1173
- Barry, C. T., Frick, P. J., & Killian, A. L. (2003). The relation of narcissism and self-esteem to conduct problems in children: A preliminary investigation. *Journal of Clinical Child and Adolescent Psychology*, *32*, 139-152. doi: 10.1207/S15374424JCCP3201_13
- Bosworth, K., & Espelage, D. (1995). *Teen conflict survey*. Bloomington, IN: Center for Adolescent Studies, Indiana University.
- Bottcher, J. (1995). Gender as social control: A qualitative study of incarcerated youth and their siblings in greater Sacramento. *Justice Quarterly*, *12*, 33-57. doi:10.1080/07418829500092561
- Breuk, R. D., Clauser, C. A. C., Stams, G. J. J. M., Slot, N. W., & Doreleijers, T. A. H. (2007). The validity of questionnaire self-report of psychopathology and parent–child relationship quality in juvenile delinquents with psychiatric disorders. *Journal of Adolescence*, *30*, 761-771. doi: 10.1016/j.adolescence.2006.10.003
- Budhani, S., & Blair, R. J. R. (2005). Response reversal and children with psychopathic tendencies: Success is a function of salience of contingency change. *Journal of Child Psychology and Psychiatry*, *46*, 972-981. doi: 10.1111/j.1469-7610.2004.00398.x.
- Caputo, A. A., Frick, P. J., & Brodsky, S. L. (1999). Family violence and juvenile sex offending: The potential mediating role of psychopathic traits and negative attitudes toward women. *Criminal Justice and Behavior*, *26*, 338-356. doi: 10.1177/0093854899026003004
- Chung, H. L., & Steinberg, L. (2006). Relations between neighborhood factors, parenting behaviors, peer deviance, and delinquency among serious juvenile offenders. *Developmental Psychology*, *42*, 319-331. doi: 10.1037/0012-1649.42.2.319
- Colins, O. F., Bijttebier, P., Broekaert, E., & Andershed, H. (2014). Psychopathic-like traits among detained female adolescents: Reliability and validity of the antisocial process screening device and the youth psychopathic traits inventory. *Assessment*, *21*, 195-209. doi: 10.1177/1073191113481997
- Cooke, D. J., & Michie, C. (2001). Refining the construct of psychopathy: Towards a hierarchical model. *Psychological Assessment*, *13*, 171-188. doi:10.1037/1040-3590.13.2.171
- da Silva, D. R., Rijo, D., & Salekin, R. T. (2013). Child and adolescent psychopathy: Assessment issues and treatment needs. *Aggression and Violent Behavior*, *18*, 71-78. doi: 10.1016/j.avb.2012.10.003

- Dillard, C. L., Salekin, R. T., Barker, E. D., & Grimes, R. D. (2013). Psychopathy in adolescent offenders: An item response theory study of the antisocial process screening device–self report and the psychopathy checklist: Youth version. *Personality Disorders: Theory, Research, and Treatment, 4*, 101-120. doi: 10.1037/a0028439
- Dodge, K. A., & Pettit, G. S. (2003). A biopsychosocial model of the development of chronic conduct problems in adolescence. *Developmental Psychology, 39*, 349-371. doi: 10.1037/0012-1649.39.2.349
- Douglas, K. S., Epstein, M. E., & Poythress, N. G. (2008). Criminal recidivism among juvenile offenders: Testing the incremental and predictive validity of three measures of psychopathic features. *Law and Human Behavior, 32*, 423-438. doi: 10.1007/s10979-007-9114-8
- Edens, J. F., Campbell, J. S., & Weir, J. M. (2007). Youth psychopathy and criminal recidivism: A meta-analysis of the psychopathy checklist measures. *Law and Human Behavior, 31*, 53-75. doi: 10.1007/s10979-006-9019-y
- Edens, J. F., Skeem, J. L., Cruise, K. R., & Cauffman, E. (2001). Assessment of “juvenile psychopathy” and its association with violence: A critical review. *Behavioral Sciences and the Law, 19*, 53-80. doi: 10.1002/bsl.425.abs
- Essau, C. A., Sasagawa, S., & Frick, P. J. (2006). Callous-unemotional traits in a community sample of adolescents. *Assessment, 13*, 454-469. doi:10.1177/1073191106287354
- Fagan, A. A., Van Horn, M. L., Hawkins, J. D., & Arthur, M. (2007). Gender similarities and differences in the association between risk and protective factors and self-reported serious delinquency. *Prevention Science, 8*, 115-124. doi:10.1007/s11121-006-0062-1
- Falkenbach, D. M., Poythress, N. G., & Heide, K. M. (2003). Psychopathic features in a juvenile diversion population: Reliability and predictive validity of two self-report measures. *Behavioral Sciences and the Law, 21*, 787-805. doi: 10.1002/bsl.562
- Farrington, D. P. (1998). Predictors, causes and correlates of male youth violence. In M. Tonry & M. Moore (Eds.), *Youth violence* (pp. 421 – 475). Chicago, IL: University of Chicago Press.
- Faul, F., Erdfelder, E., Buchner, A., & Lang, A.G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods, 41*, 1149-1160. doi: 10.3758/brm.41.4.1149
- Forth, A. E., Kosson, D. S., Hare, R. D. (2003). *The Psychopathy Checklist: Youth Version*. Toronto, ON: Multi Health Systems.
- Frick, P. J. (2009). Extending the construct of psychopathy to youth: Implications for understanding, diagnosing, and treating antisocial children and adolescents. *The Canadian Psychiatric Association Journal / La Revue De l'Association Des Psychiatres Du Canada, 54*, 803-812. Retrieved from http://labs.uno.edu/developmental-psychopathology/articles/Frick,_2009,_Extending_the_Construct_of_Psychopathy_to_Youth.pdf
- Frick, P. J., Bodin, S. D., & Barry, C. T. (2000). Psychopathic traits and conduct problems in community and clinic-referred samples of children: Further development of the psychopathy screening device. *Psychological Assessment, 12*, 382-393. doi: 10.1037/1040-3590.12.4.382
- Frick, P.J. & Dickens, C. (2006). Current perspectives on conduct disorder. *Current Psychiatry Reports, 8*, 59-72. doi: 10.1007/s11920-006-0082-3

- Frick, P. J., & Hare, R. D. (2001). *Antisocial Process Screening Device*. Toronto, ON: Multi-Health Systems.
- Frick, P. J., O'Brien, B. S., Wootton, J. M., & McBurnett, K. (1994). Psychopathy and conduct problems in children. *Journal of Abnormal Psychology, 103*, 700-707. doi: 10.1037/0021-843X.103.4.700
- Frick, P. J., Stickle, T. R., Dandreaux, D. M., Farrell, J. M., & Kimonis, E. R. (2005). Callous-unemotional traits in predicting the severity and stability of conduct problems and delinquency. *Journal of Abnormal Child Psychology, 33*, 471-487. doi: 10.1007/s10648-005-5728-9
- Gadermann, A. M., Guhn, M., & Zumbo, B. D. (2012). Estimating ordinal reliability for Likert-type and ordinal item response data: A conceptual, empirical, and practical guide. *Practical Assessment, Research & Evaluation, 17*, 1-13.
- Gardner, W., Mulvey, E. P., & Shaw, E. C. (1995). Regression analyses of counts and rates: Poisson, overdispersed Poisson, and negative binomial models. *Psychological Bulletin, 118*, 392-404. doi:10.1037/0033-2909.118.3.392
- Greene, W. H. (2000). *Econometric Analysis* (4th ed.). Upper Saddle River, NJ: Prentice Hall
- Haas, S. M., Waschbusch, D. A., Pelham Jr, W. E., King, S., Andrade, B. F., & Carrey, N. J. (2011). Treatment response in CP/ADHD children with callous/unemotional traits. *Journal of Abnormal Child Psychology, 39*, 541-552. doi: 10.1007/s10802-010-9480-4
- Hare, R. (2003). *Manual for the Hare Psychopathy Checklist*. Toronto, ON: Multi-Health Systems.
- Huizinga, D., Esbensen, F., & Weiher, A. (1991). Are there multiple pathways to delinquency? Denver youth survey. *Journal of Criminal Law and Criminology, 82*, 83-118. doi: 10.2307/1143790
- Kimonis, E. R., Frick, P. J., Boris, N. W., Smyke, A. T., Cornell, A. H., Farrell, J. M., & Zeanah, C. H. (2006). Callous-unemotional features, behavioral inhibition, and parenting: Independent predictors of aggression in a high-risk preschool sample. *Journal of Child and Family Studies, 15*, 745-756. doi: 10.1007/s10826-006-9047-8
- Kimonis, E. R., Frick, P. J., Fazekas, H., & Loney, B. R. (2006). Psychopathy, aggression, and the processing of emotional stimuli in non-referred girls and boys. *Behavioral Sciences and the Law, 24*, 21-37. doi: 10.1002/bsl.668
- Kimonis, E. R., Frick, P. J., Skeem, J. L., Marsee, M. A., Cruise, K., Muñoz, L. C., ... & Morris, A. S. (2008). Assessing callous-unemotional traits in adolescent offenders: Validation of the Inventory of Callous-Unemotional Traits. *International Journal of Law and Psychiatry, 31*, 241-252. doi: 10.1016/j.ijlp.2008.04.002
- Knight, G. P., Little, M., Losoya, S. H., & Mulvey, E. P. (2004). The self-report of offending among serious juvenile offenders cross-gender, cross-ethnic/race measurement equivalence. *Youth Violence and Juvenile Justice, 2*, 273-295. doi: 10.1177/154120400426587
- Krueger, R. F., Schmutte, P. S., Caspi, A., Moffitt, T. E., Campbell, K., & Silva, P. A. (1994). Personality traits are linked to crime among men and women: Evidence from a birth cohort. *Journal of Abnormal Psychology, 103*, 328-338. doi: 10.1037//0021-843x.103.2.328
- Laajasalo, T., Aronen, E. T., Saukkonen, S., Salmi, V., Aaltonen, M., & Kivivuori, J. (2014). To tell or not to tell? Psychopathic traits and response integrity in youth delinquency

- surveys. *Criminal Behaviour and Mental Health*. Advance online publication, 1-13. doi: 10.1002/cbm.1940
- Lee, Z., Vincent, G. M., Hart, S. D., & Corrado, R. R. (2003). The validity of the antisocial process screening device as a self-report measure of psychopathy in adolescent offenders. *Behavioral Sciences and the Law*, *21*, 771-786. doi: 10.1002/bsl.561
- Lilienfeld, S. O., & Fowler, K. A. (2006). The self-report assessment of psychopathy: Problems, pitfalls, and promises. In C. J. Patrick (Ed.), *Handbook of psychopathy* (pp. 107-132). New York, NY: Guilford Press.
- Loeber, R., & Farrington, D. P. (2000). Young children who commit crime: Epidemiology, developmental origins, risk factors, early interventions, and policy implications. *Development and Psychopathology*, *12*, 737-762. doi: 10.1017/s0954579400004107
- Loeber, R., & Hay, D. (1997). Key issues in the development of aggression and violence from childhood to early adulthood. *Annual Review of Psychology*, *48*, 371-410. doi:10.1146/annurev.psych.48.1.371
- MacCallum, R. C., Zhang, S., Preacher, K. J., & Rucker, D. D. (2002). On the practice of dichotomization of quantitative variables. *Psychological Methods*, *7*, 19 – 40. doi: 10.1037//1082-989x.7.1.19
- Marsee, M. A., Silverthorn, P., & Frick, P. J. (2006). The association of psychopathic traits with aggression and delinquency in non-referred boys and girls. *Behavioral Sciences and the Law*, *23*, 803-817. doi: 10.1002/bsl.662
- Marsh, A., Finger, E., Mitchell, D., Ried, M., Sims, C., Kosson D., ... & Blair, R.J.R (2008). Reduced amygdala response to fearful expressions in children and adolescents with callous-unemotional traits and disruptive behavior disorders. *American Journal of Psychiatry*, *165*, 712-720. doi: 10.1176/appi.ajp.2007.07071145.
- McDonald, R., Dodson, M. C., Rosenfield, D., & Jouriles, E. N. (2011). Effects of a parenting intervention on features of psychopathy in children. *Journal of Abnormal Child Psychology*, *39*, 1013-1023. doi: 10.1007/s10802-011-9512-8
- McMahon, R. J., Witkiewitz, K., & Kotler, J. S. (2010). Predictive validity of callous–unemotional traits measured in early adolescence with respect to multiple antisocial outcomes. *Journal of Abnormal Psychology*, *119*, 752-763. doi: 10.1037/a0020796
- Metz, C. E. (1986). ROC methodology in radiologic imaging. *Investigative Radiology*, *21*, 720-733. doi: 10.1097/00004424-198609000-00009
- Monahan, K. C., Steinberg, L., Cauffman, E., & Mulvey, E. P. (2009). Trajectories of antisocial behavior and psychosocial maturity from adolescence to young adulthood. *Developmental Psychology*, *45*, 1654-1668. doi:10.1037/a0015862
- Moretz, M. W., & McKay, D. (2008). Statistical conclusion and construct validity in experimental and quasi-experimental designs. In D. McKay (Ed.), *Handbook of research methods in abnormal and clinical psychology* (pp. 35-46). Thousand Oaks, CA: Sage Publications.
- Mulder, E., Brand, E., Bullens, R., & Van Marle, H. (2010). Risk factors for overall recidivism and severity of recidivism in serious juvenile offenders. *International Journal of Offender Therapy and Comparative Criminology*. doi: 10.1177/0306624x09356683
- Muñoz, L. C., & Frick, P. J. (2007). The reliability, stability, and predictive utility of the self report version of the antisocial process screening device. *Scandinavian Journal of Psychology*, *48*, 299-312. doi: 10.1111/j.1467-9450.2007.00560.x

- Murrie, D. C., & Cornell, D. G. (2002). Psychopathy screening of incarcerated juveniles: A comparison of measures. *Psychological Assessment, 14*, 390-396. doi:10.1037/1040-3590.14.4.390
- Murrie, D. C., Cornell, D. G., Kaplan, S., McConville, D., & Levy-Elkon, A. (2004). Psychopathy scores and violence among juvenile offenders: A multi-measure study. *Behavioral Sciences and the Law, 22*, 49-67. doi:10.1002/bsl.573
- Neumann, A., Barker, E. D., Koot, H. M., & Maughan, B. (2010). The role of contextual risk, impulsivity, and parental knowledge in the development of adolescent antisocial behavior. *Journal of Abnormal Psychology, 119*, 534-545. doi: 10.1037/a0019860
- Poythress, N. G., Dembo, R., Wareham, J., & Greenbaum, P. E. (2006). Construct validity of the youth psychopathic traits inventory (YPI) and the antisocial process screening device (APSD) with justice-involved adolescents. *Criminal Justice and Behavior, 33*, 26-55. doi: 10.1177/0093854805282518
- Poythress, N. G., Douglas, K. S., Falkenbach, D., Cruise, K., Lee, Z., Murrie, D. C., & Vitacco, M. (2006). Internal consistency reliability of the self-report antisocial process screening device. *Assessment, 13*, 107-113. doi:10.1177/1073191105284279
- R Core Team. (2014). *R: A language and environment for statistical computing reference index*. Retrieved from http://web.mit.edu/r_v3.0.1/fullrefman.pdf
- Ramirez, J. R., Crano, W. D., Quist, R., Burgoon, M., Alvaro, E. M., & Grandpre, J. (2004). Acculturation, familism, parental monitoring, and knowledge as predictors of marijuana and inhalant use in adolescents. *Psychology of Addictive Behaviors, 18*, 3-11. doi: 10.1037/0893-164x.18.1.3
- Rice, M. & Harris, G. (2005). Comparing effect sizes in follow-up studies: ROC Area, Cohen's *d*, and *r*. *Law and Human Behavior, 29*, 615-620. doi: 10.1007/s10979-005-6832-7.
- Salekin, R. T. (2008). Psychopathy and recidivism from mid-adolescence to young adulthood: cumulating legal problems and limiting life opportunities. *Journal of Abnormal Psychology, 117*, 386-395. doi: 10.1037/0021-843x.117.2.386
- Salekin, R. T., Leistico, A. R., Neumann, C. S., DiCicco, T. M., & Duros, R. L. (2004). Psychopathy and comorbidity in a young offender sample: Taking a closer look at psychopathy's potential importance over disruptive behavior disorders. *Journal of Abnormal Psychology, 113*, 416-427. doi:10.1037/0021-843X.113.3.416
- Silva, T., Genovés, V. G., & Latorre, M. J. (2012). The use of a screening device to assess psychopathy in young offenders. *The Spanish Journal of Psychology, 15*, 724-735. doi: 10.5209/rev_SJOP.2012.v15.n2.38884
- Spain, S. E., Douglas, K. S., Poythress, N. G., & Epstein, M. (2004). The relationship between psychopathic features, violence and treatment outcome: The comparison of three youth measures of psychopathic features. *Behavioral Sciences and the Law, 22*, 85-102. doi: 10.1002/bsl.576
- StataCorp. 2011. *Stata statistical software: Release 12*. College Station, TX: StataCorp LP.
- Stevens, J. P (1984). Outliers and influential data points in regression. *Psychological Bulletin, 95*, 334-344. doi: 10.1037//0033-2909.95.2.334
- Stickle, T. R., Marini, V. A., & Thomas, J. N. (2012). Gender differences in psychopathic traits, types, and correlates of aggression among adjudicated youth. *Journal of Abnormal Child Psychology, 40*, 513-525. doi: 10.1007/s10802-011-9588-1
- Swahn, M. H., Bossarte, R., Palmier, J., & Yao, H. (2013). Co-occurring physical fighting and suicide attempts among US high school students: Examining patterns of early alcohol use

- initiation and current binge drinking. *Western Journal of Emergency Medicine*, *14*, 341-346. doi: 10.5811/westjem.2013.3.15705
- Swets, J. A., Dawes, R. M., & Monahan, J. (2000). Psychological science can improve diagnostic decisions. *Psychological Science in the Public Interest*, *1*, 1-26. doi: 10.1111/1529-1006.001
- Thornberry, T.P., Lizotte, A.J., Krohn, M.D., Farnworth, M., & Jang, S.J. (1994). Delinquent peers, beliefs, and delinquent behavior: A longitudinal test of interactional theory. *Criminology*, *32*, 47-83. doi: 10.1111/j.1745-9125.1994.tb01146.x
- Thornton, L. C., Frick, P. J., Crapanzano, A. M., & Terranova, A. M. (2013). The incremental utility of callous-unemotional traits and conduct problems in predicting aggression and bullying in a community sample of boys and girls. *Psychological Assessment*, *25*, 366-378. doi: 10.1037/a0031153
- Van Belle, G., Fisher, L. D., Heagerty, P. J., & Lumley, T. (2004). *Biostatistics: A methodology for the health sciences*. Hoboken, NJ: John Wiley & Sons
- Vaughn, M. G., Newhill, C. E., DeLisi, M., Beaver, K. M., & Howard, M. O. (2008). An investigation of psychopathic features among delinquent girls: Violence, theft, and drug abuse. *Youth Violence and Juvenile Justice*, *6*, 240-255. doi: 10.1177/1541204007312298
- Viljoen, J. L., MacDougall, E. A. M., Gagnon, N. C., & Douglas, K. S. (2010). Psychopathy evidence in legal proceedings involving adolescent offenders. *Psychology, Public Policy, and Law*, *16*, 254-283. doi: 10.1037/a0019649
- Viljoen, J. L., McLachlan, K., & Vincent, G. M. (2010). Assessing violence risk and psychopathy in juvenile and adult offenders: A survey of clinical practices. *Assessment*, *17*, 377-395. doi: 10.1177/1073191109359587
- Vitacco, M. J., Rogers, R., & Neumann, C. S. (2003). The antisocial process screening device an examination of its construct and criterion-related validity. *Assessment*, *10*, 143-150. doi: 10.1177/1073191103010002005
- Zeileis, A., Kleiber, C., & Jackman, S. (2007). *Regression models for count data in R*. Department of Statistics and Mathematics, WU Vienna University of Economics and Business, Vienna. Retrieved from <https://cran.r-project.org/web/packages/pscl/vignettes/countreg.pdf>

Tables and Figures

Table 1. *Descriptive Statistics and Correlations between the APSD, Demographic Control Variables, Common Criminogenic Factors, and Self-Reported Offending*^{1, 2, 3}

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. APSD Total	--													
2. APSD IMP	.77***	--												
3. APSD NAR	.81***	.51***	--											
4. APSD CU	.56***	.16**	.16**	--										
5. Age	.09	.07	.07	.03	--									
6. Male	.11	.08	.01	.15**	-.08	--								
7. Ethnicity	-.02	-.04	.01	.04	-.02	-.09	--							
8. Prior Offending	.41***	.35***	.30***	.24***	.01	.11	-.09	--						
9. Delinquent Peers	.37***	.40***	.30***	.14*	.03	-.04	-.02	.19***	--					
10. School Failure	.16**	.16**	.06	.15**	-.10	.03	-.10	.22***	.02	--				
11. Substance Use	.24***	.27***	.21***	-.01	.07	-.12*	-.10	.23***	.32***	.11	--			
12. Parental Monitoring	-.48***	-.45***	-.31***	-.27***	-.02	-.13*	.08	-.26***	-.33***	-.18**	-.28***	--		
13. Violent Offending	.32***	.28***	.20***	.18**	-.06	.19**	-.07	.42***	.22***	.21***	.32***	-.20***	--	
14. Non-Violent Offending	.36***	.31***	.27***	.16**	-.01	.02	-.05	.28***	.28***	.21***	.36***	-.30***	.44***	--
<i>N</i>	335	333	335	333	335	334	290	334	335	326	335	335	335	335
Mean/%	9.44	3.32	2.58	2.95	13.07	44.5%	--	30.8%	1.36	20.6%	0.16	4.86	0.30	0.30
SD/ <i>n</i>	4.35	1.73	2.06	1.74	0.39	149	--	103	2.24	69	0.72	1.49	0.71	0.86
Possible Range	0-40	0-10	0-14	0-12	--	--	--	--	0-27	--	0-24	0-6	0-8	0-13
Actual Range	0-23	0-9	0-11	0-10	--	--	--	--	0-16	--	0-7	0-6	0-6	0-8.67

Note. ¹ Descriptive statistics and correlations reported for continuous violent and non-violent offending variables. ² Correlations among criminogenic Predictors ranged from -.33 to .41, suggesting that predictors were conceptually distinct (i.e., they possess a fair amount of independent variance).

APSD = Antisocial Process Screening Device. IMP = Impulsivity. NAR = Narcissism. CU = Callous-Unemotional traits.

* $p < .05$, ** $p < .01$, *** $p < .001$ (two tailed).

Table 2. *Predictive Accuracy of APSD Total Scores at Various Cut-Off Points*

Percentile Cut-Off	APSD Cut-Score	Violent Offending				Non-Violent Offending			
		Sensitivity	Specificity	PPP	NPP	Sensitivity	Specificity	PPP	NPP
25 th	6	92.75%	21.76%	23.79%	91.94%	98.31%	22.42%	21.56%	98.39%
50 th	9	81.16%	49.62%	29.63%	90.97%	86.21%	49.45%	26.46%	94.44%
75 th	12	53.62%	77.36%	38.14%	86.50%	57.63%	77.09%	35.05%	89.45%
90 th	15	23.19%	92.86%	45.71%	82.33%	25.42%	92.75%	42.86%	85.33%
95 th	17	14.49%	95.86%	47.62%	81.21%	18.64%	96.38%	52.38%	84.71%

Note. APSD = Antisocial Process Screening Device. PPP = Positive Predictive Power. NPP = Negative Predictive Power.

Table 3. Incremental Predictive Validity of the APSD over Demographic Control Variables and Common Criminogenic Factors

	Violent Offending				Non-Violent Offending				
	<i>b</i> (SE)	<i>z</i>	<i>P</i>	Exp (B) [95% CI]	<i>b</i> (SE)	<i>z</i>	<i>p</i>	Exp (B) [95% CI]	
Step 1									
Age	-0.51 (0.32)	-1.59	.111	0.59 [0.32, 1.13]	-0.02 (0.41)	-0.05	.960	0.98 [0.44, 2.17]	
Male	-0.00 (0.01)	0.19	.854	1.00 [0.98, 1.02]	-0.00 (0.02)	-0.18	.858	0.99 [0.96, 1.03]	
Asian	-0.08 (0.35)	0.24	.813	1.09 [0.54, 2.17]	-0.66 (0.48)	-1.40	.163	0.52 [0.20, 1.31]	
Caucasian	0.44 (0.30)	1.45	.146	1.56 [0.86, 2.83]	-0.17 (0.43)	-0.41	.684	0.84 [0.36, 1.95]	
Other Ethnic Minority	-0.52 (0.40)	-1.30	.193	0.60 [0.27, 1.30]	-2.45 (0.48)	-0.52	.606	0.78 [0.30, 2.01]	
Prior Offending	0.81 (0.26)	3.13	.002	2.26 [1.36, 3.75]	0.10 (0.34)	0.30	.766	1.11 [0.57, 2.16]	
Delinquent Peers	1.74 (0.46)	3.81	< .001	5.67 [2.32, 13.84]	1.64 (0.55)	3.00	.003	5.17 [1.75, 15.27]	
School Failure	0.62 (0.28)	2.21	.027	1.86 [1.07, 3.23]	0.68 (0.37)	1.85	.064	1.97 [0.96, 4.07]	
Substance Use	1.80 (0.53)	3.38	.000	6.05 [2.13, 17.16]	1.66 (0.87)	1.92	.055	5.27 [0.96, 28.92]	
Parental Monitoring	-0.06 (0.08)	-0.74	.457	0.94 [0.81, 1.10]	-0.35 (0.10)	-3.44	.001	0.70 [0.58, 0.86]	
Model	$\chi^2(10) = 95.06, p < .001$				$\chi^2(10) = 77.13, p < .001$				
Step 2									
Age	-0.60 (0.32)	-1.89	.059	0.55 [0.30, 1.02]	-0.27 (0.40)	-0.67	.502	0.76 [0.35, 1.67]	
Male	-0.00 (0.01)	0.15	.879	1.00 [0.98, 1.02]	-0.00 (0.02)	-0.14	.891	0.99 [0.95, 1.04]	
Asian	0.15 (0.35)	0.43	.669	1.16 [0.58, 2.32]	-0.59 (0.47)	-1.25	.211	0.56 [0.22, 1.40]	
Caucasian	0.42 (0.31)	1.35	.178	1.52 [0.83, 2.78]	0.04 (0.42)	0.09	.928	1.04 [0.46, 2.35]	
Other Ethnic Minority	-0.47 (0.39)	-1.20	.230	0.62 [0.29, 1.35]	-0.23 (0.47)	-0.49	.623	0.79 [0.31, 2.00]	
Prior Offending	0.65 (0.26)	2.47	.013	1.91 [1.14, 3.19]	-0.27 (0.34)	-0.79	.430	0.76 [0.39, 1.49]	
Delinquent Peers	1.63 (0.47)	3.50	< .001	5.11 [2.05, 12.74]	1.55 (0.55)	2.83	.005	4.69 [1.61, 13.67]	
School Failure	0.71 (0.28)	2.51	.012	2.03 [1.17, 3.53]	0.69 (0.36)	1.91	.056	1.99 [0.98, 4.04]	
Substance Use	1.30 (0.56)	2.32	.020	3.68 [1.23, 11.03]	0.72 (0.87)	0.82	.410	2.05 [0.37, 11.40]	
Parental Monitoring	0.04 (0.09)	0.46	.547	1.04 [0.88, 1.23]	-0.18 (0.11)	-1.72	.086	0.83 [0.68, 1.03]	
APSD	0.10 (0.03)	2.96	.003	1.11 [1.03, 1.18]	0.17 (0.04)	3.73	< .001	1.18 [1.08, 1.29]	
Model	$\chi^2(11) = 103.31, p < .001, \Delta\chi^2(1) = 8.25, p = .004$				$\chi^2(11) = 95.10, p < .001, \Delta\chi^2(1) = 17.97, p < .001$				

Note. APSD = Antisocial Process Screening Device. CI = Confidence intervals. All significant Exp (B) values did not contain one based on 95% CIs.

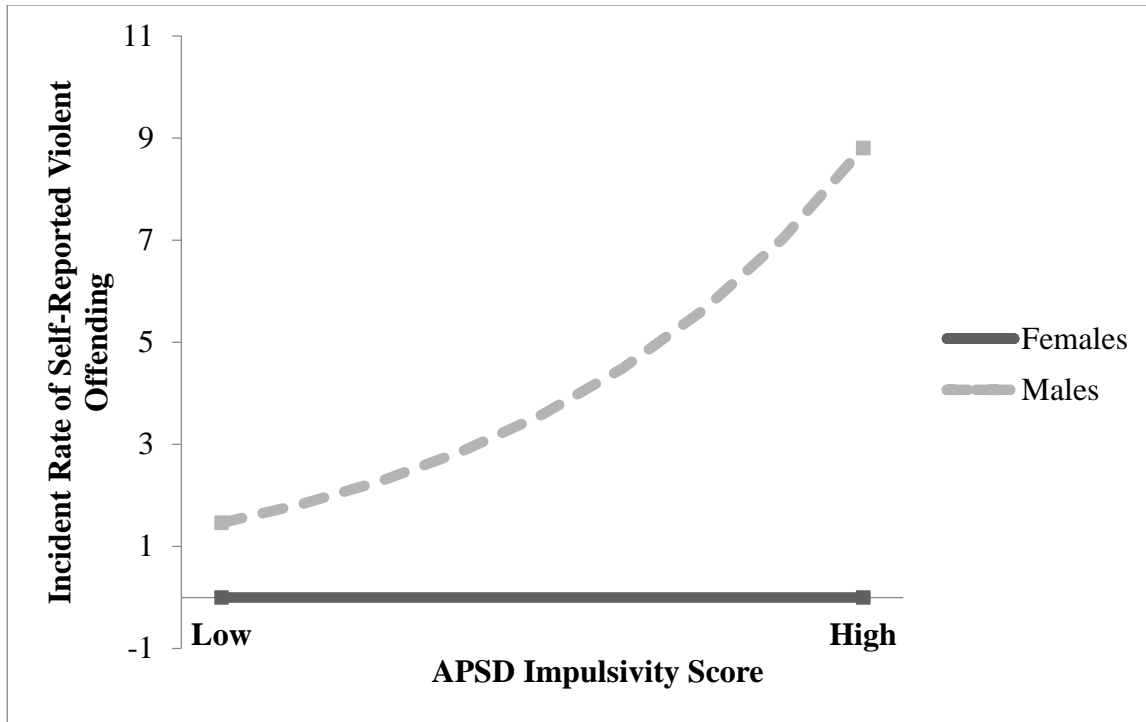


Figure 1. Plot of Significant Sex x APSD Impulsivity Score Interaction. Incident rate of self-reported violent offending is plotted for males and females at low (-2 SD) and high (+2 SD) values of APSD Impulsivity scores. APSD = Antisocial Process Screening Device.