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A Multi-method Assessment of Juvenile Psychopathy:

Comparing the Predictive Utility of the PCL:YV, YPI, and NEO-PRI

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The Pathways study was supported by funds from the following: Office of Juvenile Justice and Delinquency Prevention, National Institute of Justice, John D. and Catherine T. MacArthur Foundation, William T. Grant Foundation, Robert Wood Johnson Foundation, William Penn Foundation, Center for Disease Control, National Institute on Drug Abuse (R01DA019697), Pennsylvania Commission on Crime and Delinquency, and the Arizona Governor's Justice Commission. We are grateful for their support. The content of this paper, however, is solely the responsibility of the authors and does not necessarily represent the official views of these agencies. We are grateful to our collaborators, Robert Brame, Laurie Chassin, Sonia Cota-Robles, Jeffrey Fagan, George Knight, Sandra Losoya, Edward Mulvey, Alex Piquero, Carol Schubert, and Laurence Steinberg for their comments on earlier drafts of the manuscript, and to the many individuals responsible for the data collection and preparation. Address correspondence to Elizabeth Cauffman, Psychology & Social Behavior, 3355 Social Ecology II, University of California, Irvine, CA 92617 or via e-mail, at cauffman@uci.edu.

Submitted—July 30, 2008

Abstract

The present study examines the relation between three unique approaches to measuring psychopathy: a clinical interview method (the Psychopathy Checklist: Youth Version), a new self-report measure (the Youth Psychopathic Traits Inventory), and a personality-based approach (the NEO Personality Inventory-Revised), as well as the utility of each method to predict short- (6 and 12 months) and long-term (3-years) offending among a sample of serious juvenile offenders. Results indicate a modest degree of overlap between all three measures (r's = .26 to .36); however, youth identified as psychopathic by one measure are not necessarily classified as psychopathic by other measures. Measures were weakly correlated with offending during the subsequent 6- and 12- month follow-up periods and the PCL:YV did not predict offending 3 years later. Findings suggest that while such scores may be useful indicators of the need for heightened monitoring in the short-term, they do not predict long-term recidivism. More importantly, the fact that a youth could be identified as psychopathic on one measure of psychopathy, but not consistently on other measures of psychopathy, raises concerns about the validity of these measures for making legal or clinical treatment decisions.

A Multi-method Assessment of Juvenile Psychopathy: Comparing the Predictive Utility of the PCL:YV, YPI, and NEO-PRI

A reliable technique for predicting future criminal behavior among juvenile offenders is sought by psychologists, criminologists, juvenile justice personnel, and policy-makers alike. Given that adult psychopaths tend to have long and "productive" criminal careers and are often deemed resistant to treatment (Ogloff, Wong, & Greenwood, 1990; Rice, Harris, & Cormier, 1992), psychopathy is often included as one component of a comprehensive risk assessment battery. Because psychopathy is traditionally viewed as a stable personality disorder, the term was once reserved for application only to adults (the argument being that personality disorders cannot be reliably identified until one's personality has stabilized in adulthood). Measures of psychopathy in adults have proven to be highly predictive of future violence (Harris, Rice et al. 1991; Serin 1996; Hemphill, Hare et al. 1998; Glover, Nicholson et al. 2002), which has sparked considerable interest in applying the construct of psychopathy to adolescents. In doing so, researchers have hoped to distinguish between adolescent offenders whose behavior is transient and those whose behavior will persist across adulthood (Caputo, Frick, & Brodsky, 1999; Kruh, Frick, & Clements, 2005).

Although the advent of "juvenile psychopathy" has been both rapid and recent, measures designed to assess psychopathy in juvenile populations are being used with increasing frequency to make adjudication decisions in court cases involving adolescents. Indeed, the scores on such measures may now determine whether a youth is tried in juvenile or adult court and in turn, whether sentencing is focused on treatment or on punishment (Petrila & Skeem, 2003; Seagrave & Grisso, 2002). Notably, however, very little research has examined if these measures of

juvenile psychopathy actually predict long-term recidivism among adolescent offenders. It is therefore imperative that research (1) evaluate the validity of measures of psychopathy in juveniles to predict subsequent recidivism and (2) assess whether some assessment strategies are more useful than others in distinguishing among youth who cease antisocial behavior and youth who persist in antisocial behavior. In order to adequately study long-term patterns of offending, it is important to utilize a sample of individuals who are more likely to exhibit such behavior (e.g., youths who are known to be antisocial). The present study aims to examine the relations between three distinct measures of psychopathy and to evaluate the relative power of these measures to predict subsequent offending in a sample of serious juvenile offenders. Specifically, this paper will examine the short- and long-term predictive utility of three different assessments of psychopathy: a clinical interview method (the Psychopathy Checklist: Youth Version; PCL:YV), a more recently developed self-report measure (the Youth Psychopathic Traits Inventory; YPI), and a personality-based approach (the five factor model using the NEO Personality Inventory-Revised; NEO PI-R).

Assessing Psychopathy

Although not an official DSM-IV disorder, psychopathy is a well-studied construct that is considered to be a personality disorder defined by a cluster of affective, interpersonal, and lifestyle/behavioral characteristics (Cleckley, 1976; Hare, 2003). The prototypical psychopath is egocentric, callous, and manipulative as well as impulsive and unable to maintain close relationships. Although classic measures of psychopathy, namely Hare's Psychopathy Checklist, conceived of psychopathy as two domains, emotional detachment and antisocial lifestyle (Hare, 1991), recent studies suggest that three- (see Cooke & Michie, 2001) and four-factor solutions (see Hare, 2003) may provide a better fit of the measure. Similarly, studies examining the fit of

various structural models of the youth version of the Psychopathy Checklist (PCL:YV) have found some support for both three- and four-factor solutions in samples of juvenile offenders (Forth, Kosson et al. 2003; Jones, Cauffman et al. 2006; Neumann, Kosson et al. 2006; Salekin, Brannen et al. 2006), although the three-factor model of PCL:YV (comprised of interpersonal, affective, and lifestyle facets) appears to be the most appropriate for adolescents (Jones et al., 2006; Skeem & Cooke, in press).

The Psychopathy Checklist-Revised (PCL-R; Hare, 1991) is the most extensively studied measure of psychopathy in adults. PCL-R scores are among the most predictive indicators available for future violent behavior among adults (Harris, Rice et al. 1991; Serin 1996; Hemphill, Hare et al. 1998; Glover, Nicholson et al. 2002), and the PCL-R has been described as the "gold standard" against which alternative approaches are measured. This measure has recently been extended downward for use with adolescent populations, leading to the development of the Psychopathy Checklist: Youth Version (PCL:YV; Forth, Kosson, & Hare, 2002; Hare, 2003). The PCL:YV retains the same general features of the adult measure, with slight modifications intended to make the items more developmentally appropriate for use with institutionalized adolescent offenders. Consistent with its parent measure, the PCL:YV is administered in the form of an intensive one-on-one semi-structured interview, as well as a review of information from collateral sources and institutional files. Given the complexity of the evaluation process, administration of the PCL:YV requires extensive training.

Due to the considerable training required and time-consuming procedures involved in the administration and scoring of the PCL:YV (approximately 3 or more hours), numerous alternative self-report measures have been developed for assessing psychopathic traits in adolescents. One such measure is the Youth Psychopathic Traits Inventory (YPI; Andershed et

al., 2002). The YPI is a 50-item self report measure that was developed for use with community youths and is based on the three-factor model of psychopathy. Specifically, the YPI is organized into 10 subscales that confirmatory factor analyses has suggested form three interrelated factors: Grandiose/Manipulative, Callous/Unemotional, and Impulsive/Irresponsible (Andershed et al., 2002; Larsen et al., 2006).

An increasingly popular alternative to self-report measures to assess psychopathic features is the use of the multi-scale personality inventories (Benning, Patrick, Blonigen, Hicks & Iacono, 2005; Derefinko & Lynam, 2006; Douglas, Guy, Edens, Boer, & Hamilton, 2007; Lynam & Widiger, 2007; Miller & Lynam, 2003; Miller, Lynam, Widiger, & Luekfield, 2001). One such approach postulates that psychopathy can be represented using the well-validated Five-Factor Model (FFM) of personality, as measured by NEO (Costa & McCrae, 1992; Widiger & Lynam, 1998). The FFM, comprised of Extraversion, Agreeableness, Conscientiousness, Neuroticisim, and Openness, is considered one of the classic approaches to describing the basic traits of normal personality (McCrae & Costa, 1980). Based on scores on each of these five factors, researchers can identify individuals who appear psychopathic.

Preliminary research suggests that juvenile psychopathy can be understood and represented using these common dimensions of personality as it has been found to be negatively related to Agreeableness, Conscientiousness, and – at times – Neuroticism (Lynam, 2002; Lynam et al., 2005; Salekin et al., 2004). Widiger and Lynam (1998) went a step further in translating the 20 items of the PCL-R into the framework of general personality traits by asking 21 experts in the field of psychopathy to rate how "the prototypical, classic Cleckley psychopath" would score on each of the thirty facets of the FFM, using a scale of 1 (extremely low) to 5 (extremely high) (see Lynam & Widiger, 2007). The individual's NEO profile is

compared to the expert-generated NEO psychopathy prototype profile, creating a measure of similarity of the individual's personality traits with those of a prototypical psychopath. This comparison is achieved by computing the Psychopathy Resemblance Index (PRI). This method may resolve concerns about the factor structure of psychopathy, as well as the comorbidity of psychopathy with other personality disorders (Lynam, 2002; Miller et al., 2001). Miller et al. (2001) established the convergent validity of this approach by reporting positive correlations with a self-report measure (the Levenson Self-Report Psychopathy Scale) of psychopathy (r = .46) (Miller et al., 2001). To date, however, the utility of the NEO, when used with adolescents, remains untested (Lynam, 2007 personal communication).

While little research has examined the overlap among all three assessments of juvenile psychopathy, research has suggested that the PCL:YV and the YPI do overlap significantly. For example, results from a sample of 160 serious male offenders indicate that these two conceptualizations of psychopathy have some overlap (YPI total score and PCL:YV total score r = .24), although the majority of this overlap was observed in the interpersonal and affective domains (Skeem & Cauffman, 2003). In contrast, a more recent study of 115 male adolescents with a DSM-IV diagnosis of conduct disorder found modest overlap between the YPI total score and the PCL:YV total score (r = .29), but the observed overlap also involved the behavioral factor of the PCL:YV (r = 32), rather than the interpersonal domain (Dolan & Rennie, 2006). However, in a study 162 boys and girls who received services at a clinic for adolescents with substance abuse problems, moderate correlations (r's = .30 - .51) were observed between the YPI and PCL:YV factor scores, with a high degree of overlap between the groups having the lowest and highest YPI scores and the groups having the lowest and highest PCL:YV scores (Andershed, Hodgins, & Tengstrom, 2007). While the extreme YPI and PCL:YV groups

displayed categorical convergent validity, the middle groups did not. Thus, while there is some evidence to suggest that the YPI and PCL:YV measures show overlap, it is unclear how these two variables are associated with the NEO PI-R.

Predictive Utility of Psychopathy Assessments

While evidence of the predictive utility of psychopathy assessments is much more plentiful in adult samples, several studies have examined the relation between psychopathy and subsequent offending among adolescents (e.g., Catchpole & Gretton, 2003; Corrado et al., 2004; Falkenbach et al., 2003; Forth et al., 1990; Gretton et al., 2001, 2004; Salekin, 2008; Toupin et al., 1995) and more specifically juvenile offenders (see Edens & Campbell, 2007; Edens, Cambell, & Weir, 2007; Skeem & Cauffman, 2003). In general, results suggest that psychopathy is also predictive of subsequent offending in juveniles, although the relation between psychopathy and offending is weaker than what is documented in the adult literature. For example, in a study that modified the PCL-R for youth (pre-dating the PCL:YV), results indicated that total scores were predictive of violent reoffending ($r = .26$) over a two-year period (Forth, Hart, & Hare, 1990). Other studies have found relations between psychopathy and institutional violence. For example, in a study of 85 male juvenile offenders (ages 11 to 18), scores on various psychopathy assessments were found to be correlated with infractions within the institution (r's range from .20 to .40; Spain et al., 2004). In a 10-year retrospective study, Gretton, Hare, and Catchpole (2004) found that juveniles who scored high (i.e, 30 or above) on the PCL:YV were four times more likely to have reoffended and three times more likely to reoffend violently when compared with those who scored low on the PCL:YV.

A growing body of research has found moderate to strong relations between high scores on measures of psychopathy and past or concurrent delinquent and offending behavior (Brandt,

Kennedy, Patrick & Curtin, 1997; Murrie, Cornell, Kaplan, McConville, & Levy-Elkon, 2004; Spain, Douglas, Pythress, & Epstein, 2004; Stafford & Cornell, 2003; exceptions see Catchpole & Gretton, 2003; Corrado et al., 2004; Falkenbach et al., 2003; Forth, Hart, & Hare, 1990; Gretton et al., 2001, 2004; Skeem & Cauffman, 2003; Toupin et al., 1995;) For example, in a study of 160 serious juvenile offenders, both the PCL:YV and the YPI were found to be predictive of misconduct during the previous one-month period (Skeem & Cauffman, 2003). However, the type of behaviors that the two psychopathy measures predicted was largely non-overlapping. The YPI (particularly the Lifestyle/Behavioral dimension) better predicted a range of and institutional infractions (*AUC* = .66) than the PCL:YV (*AUC*= .58), whereas the PCL:YV (particularly the Affective dimension) predicted disciplinary actions taken against youth (*AUC*=.67) better than the YPI (*AUC*= .48). In a more recent study by Dolan & Rennie (2006), the PCL:YV was more accurate in predicting institutional infractions over a 12-month follow-up period when compared with the YPI.

The success of the PCL-R as a predictor of recidivism in adults (Hemphill et al., 1998; Salekin, Rogers, & Sewell, 1996; Walters, 2003) has led to the PCL:YV being considered the corresponding "gold standard" among adolescents, despite the fact that there are only a handful of studies that have examined its long-term predictive validity. In a 55-month prospective follow-up study of 220 male juvenile offenders, youths with high scores on the PCL:YV engaged in greater violent and nonviolent reoffending compared to those who scored low on the PCL:YV (Gretton et al., 2001). However, in a more recent study of 75 male juvenile offenders, Edens and Cahill (2007) found that neither total scores nor factors scores of the PCL:YV predicted general or violent reconvictions over a 10-year follow-up period.

Goal of the Present Study

The first goal of this paper is to compare three measures of psychopathy which, as noted earlier, employ very different methods of assessment. This is the first study to examine the FFM-based psychopathy assessment using NEO-PI-R PRI data obtained from juvenile offenders and comparing it to other assessment strategies. In addition, the size of our sample is sufficient to allow confirmatory factor analysis to determine whether these three measures probe the same underlying construct. We also examine the short- and long-term predictive validity of these measures to determine whether one approach is preferable to another as a predictor of future offending behavior and if psychopathic youths differ from nonpsychopathic youths on a number of theoretically related domains (e.g., neurological functioning, IQ, peer relationships). Because many measures designed to assess psychopathy (most notably the PCL-R and PCL:YV) specifically include antisocial behavior as an evaluation criterion (exception see Kosson et al., 2002; Murrie et al., 2004), researchers have raised concerns that the predictive power of such measures is based on the antisocial components of the measure rather than the core personality traits. Not only does this study employ the three- (rather than four-) factor model that excludes antisocial behavior when evaluating the predictive validity of the PCL:YV, , but we also employ two other measures of psychopathy that do not contain antisocial items (YPI and the NEO-PR-I). In this study we also examine the predictive utility of the individual dimensions of psychopathy (Interpersonal, Affective, Lifestyle).

Method

Participants

Participants were adolescents enrolled in the Pathways to Desistance study (see Mulvey, et al., 2004), a prospective study of 1,354 serious juvenile offenders (86% male) in Phoenix

(N=654) and Philadelphia (N=700). Complete details of the study methodology are provided in Schubert et al. (2004). Given the focus of the current study, only male offenders were included in the analyses (N=1171).

Adolescents were eligible for the study if they were between 14-17 years of age (mean 16.55) at the time of their arrest and adjudicated of a serious criminal offense. Eligible crimes included felony offenses against persons and property, as well as several misdemeanor weapons offenses and sexual assault. Specifically, the juveniles were sentenced for a range of committing offenses: 44.5% for violent crimes against persons (e.g., murder, rape, robbery, assault), 26.9% for property crimes (e.g., arson, burglary, receiving stolen property), 10.2% for weapons, and 3.9% for other crimes (e.g., conspiracy, intimidation of a witness). Because drug law violations represent an especially large proportion of the offenses committed by this age group, the proportion of juvenile males with drug offenses was capped at 15% of the sample at each site to ensure adequate sample heterogeneity with respect to criminal offending.

Participants were interviewed, on average, 36.9 days (standard deviation = 20.6) after their adjudication (for those in the juvenile system) or their decertification hearing in Philadelphia or an adult arraignment in Phoenix (if in the adult system). Participants were predominantly lower SES, with fewer than 2.5% of the participants' parents holding a four-year college degree, and 47% with parents having less than a high-school education. The sample was primarily African-American (42.2%), followed by 34% Hispanic-American, 19.2% non-Hispanic Caucasian, and 4.7% other.

Procedures

The juvenile court in each locale provided the names of eligible adolescents (based on age and adjudicated charge). Interviewers then attempted to contact each eligible juvenile and his or

her parent or guardian to ascertain the juvenile's interest in participation and to obtain parental consent. Once the appropriate consents had been obtained, interviews were conducted at a correctional facility if the juvenile was confined, at the juvenile's home, or a mutually agreed-upon location in the community. All recruitment and assessment procedures were approved by the IRBs of the participating universities, and adolescents were paid for their participation in the community and when allowed by facility rules ($50 for the baseline interview with payment increasing at each time point to a maximum $150 per interview at the 36 month follow-up).

The baseline interview was administered over two days in two, two-hour sessions. Interviews and participants sat side-by-side facing a computer, and questions were read aloud to avoid any problems caused by reading difficulties. Respondents could answer the questions aloud or, to maximize privacy, enter their responses on a keypad (although in some facilities, this option was not available). When interviews were conducted in participants' homes or in community settings, attempts were made to conduct them out of the earshot of other individuals. Honest reporting was encouraged, and confidentiality was reinforced by informing participants of the requirement for confidentiality placed upon us by the U.S. Department of Justice that prohibits our disclosure of any personally identifiable information to anyone outside the research staff, except in cases of suspected child abuse or where an individual was believed to be in imminent danger. Participants were also interviewed every six-months for thirty-six-months (a three-year follow-up). The percentage of completed interviews among enrolled participants before passing out of the window of opportunity for that specific time point (i.e., within 6 weeks of the scheduled follow-up) were 93% at the 6 month follow-up, 93% at the 12 month follow-up, 91% at the 18 month follow-up, 91% at the 24 month follow-up, 91% of the 30 month follow-up, and 91% at the 36 month follow-up. Thus, there was very low attrition of the sample over time.

In addition to the participant data, data was also gathered from two additional sources. First, interviews were also conducted with an adult "collateral" (i.e., someone named by the adolescent as knowing what is going on in his/her life, in almost all instances a parent) and was used to supplement information provided by the adolescent. Collateral interviews were conducted for 88% of the participants at the baseline interview, with the biological mother being the modal informant (67%). In addition to collateral reports, we also collected information from official court files. These files provided information on criminal history and 79% of participants had valid court data by the baseline interview.

Measures

Psychopathy. Psychopathy was assessed via three measures: the Psychopathy Checklist: Youth Version (PCL:YV), the Youth Psychopathic Traits Inventory (YPI), and the NEO Personality Inventory – Short Form (NEO PI-R). As this is a longitudinal study with data collected at baseline through 36 months (7 data collection points), several of the measures were assessed at different time points. The PCL: YV was assessed at the baseline interview only. The YPI was assessed at the 6 month interview and at each subsequent 6-month follow-up (through month 36). The NEO PI-R was only assessed at the 24 month interview.

The first measure of psychopathy was the Psychopathy Checklist: Youth Version. The Psychopathy Checklist: Youth Version (PCL: YV; Forth et al., 2003), which is a 20-item rating scale targeted for use with adolescents 13 years of age or older. Scores on each of the 20 items are based on three sources: (1) an interview with the youth, (2) charts, and (3) collateral report. The original semi-structured interview guide (Forth et al., 2004) was adapted for use in this study (Skeem & Cauffman, 2001) and reviewed with Adelle Forth. This interview was designed to assess the youth's interpersonal style and attitudes, obtain information on various aspects of his

functioning (psychological, educational, occupational, family, and peer domains), and assess (through comparison with records or collateral reports) the credibility of his statements.

Because of the complexity of administering the PCL:YV, all interviewers completed extensive training, including 8 hours of didactic and experiential exercises, as well as observing, rating, and discussing two live interviews. Interviewers were also required to rate six videotaped cases with scores falling within 5 points of the criterion PCL: YV total score. In addition to the initial training, we also conducted meetings to discuss cases and scoring issues. To assess inter-rater reliability for PCL:YV total score, intraclass correlation coefficients (ICCs) were computed using a two-way mixed effects model, with raters as a fixed factor and agreement defined as absolute using raters' PCL: YV scores based upon four videotaped cases completed near the end of their training sequence. Our analyses indicated excellent rates of agreement for PCL: YV total scores (ICC=.91). Moreover, an examination of both the modified versions of the Cooke and Michie (2001) three-factor model and the Hare (2003) four-factor model demonstrated a moderate-to-good fit of the measure (Jones, Cauffman, Miller, & Mulvey, 2006).

After completing the interview with a participant and reviewing official records and collateral (typically mother) reports about participants, the interviewer evaluated how well 20 statements described youths (e.g., "Poor anger control", "Lack of remorse", and "Stimulation seeking") used a 3-point ordinal scale ("Item does not apply to the youth" or "Item applies to a certain extent" or "Item applies to the youth"). [1] Higher scores are indicative of a greater number and/or severity of psychopathic characteristics. In this article, we utilize PCL-YV score in three ways (a) a continuous scores (factor and total scores), (b) a dichotomous classification based on the traditional total threshold score of over 30 (psychopathic) compared to 30 or less (non-

psychopathic), and (c) a more lenient dichotomous classification based on a score greater than 25 (psychopathic) or 25 or less (non-psychopathic).

The second measure used to assess psychopathy is the Youth Psychopathic Traits Inventory. The Youth Psychopathic Traits Inventory (YPI; Andershed, et al., 2002) is a 50-item self-report measure based on contemporary adult models of psychopathy (Cleckley, 1941; Cook & Michie, 2001; Hare, 1991). The YPI was developed as a research instrument for identifying youths (ages 12 and above) who will persist in frequent and serious antisocial behavior from adolescence into adulthood. The measure consists of 10 scales designed to capture "core" traits: *dishonest charm, grandiosity, lying, manipulation, remorselessness, callousness, unemotionality, impulsiveness, irresponsibility,* and *thrill seeking.* These 10 scales map onto three domains: Interpersonal (Grandiose-Manipulative), Affective (Callous-Unemotional), and Lifestyle/Behavioral (Impulsive-Irresponsible). Importantly, the YPI does not frame psychopathic traits as deficits (e.g., "My emotions are more shallow than others'"), but instead as neutral or appealing characteristics (e.g., "I usually feel calm when other people are scared", "It's fun to make up stories and try to get people to believe them", and "To feel guilt and regret when you have done something wrong is a waste of time"). Phrasing the items in this neutral manner reduces the likelihood that youths are selecting a socially desirable answer. Participants respond to each item on a 4-point Likert scale ranging from "Does not apply at all" to "Applies very well"; higher scores indicate more psychopathic characteristics. The measure had good reliability ($\alpha = .93$) and validity (CFI = .95; NFI = .93; RMSEA = .09) at the baseline interview

The final assessment of psychopathy was the NEO Psychopathy Resemblance Index (NEO PRI). At the 24-month follow-up interview, participants were administered a 120-item shortened version of the NEO Personality Inventory – Revised (NEO PI-R; Costa & McCrae

1992; Reise & Henson, 2000). Although the traditional NEO PI-R consists of 240 items, a computerized and adapted administration version of the measure can be administered in 120-items with valid scores that map onto the larger version of the NEO PI-R (Reise & Henson, 2000). Youth are asked to rate the veracity of statements (e.g., "I have a low opinion of myself") on a 5-point scale from "strongly disagree" to "strongly agree". Scores are combined to create an assessment of each of the Big 5 personality domains: neuroticism, extraversion, openness to experience, conscientiousness, and agreeableness.

To assess psychopathy, a youth's scores in each domain are compared to a standardized 'psychopathic prototype' score. Thus, based on answers on the NEO PI-R, a Psychopathy Resemblance Index (PRI) is calculated for each participant. Researchers developed a psychopathy prototype by sending a questionnaire, consisting of 30 bipolar statements, each representing one facet of the NEO PI-R, to 21 prominent psychopathy researchers (Miller, Lynam, Widiger, & Leukefeld, 2001). These experts then rated the "prototypical" psychopath on the 30 facets of the NEO PI-R using a 5-point Likert scale from 1 (Extremely low) to 5 (Extremely high). The mean rating for each item across experts was calculated to designate a prototypic psychopathy profile (see Miller & Lynam, 2003). Thus, the NEO PRI is an indication of the degree of similarity between an individual's NEO PI-R profile and the expert consensus profile on the "prototypical" psychopath. The NEO PRI is calculated as an intraclass Q correlation and can range from –1 to 1 with higher scores indicating greater resemblance to the prototype (Lynam & Widiger, 2001; Miller & Lynam, 2003).

Offending Behavior. Antisocial and illegal activities were measured using two methods: official record and self-report. First, official report was used to assess offending behavior prior to the baseline interview. Juvenile court records were coded regarding prior involvement with

the legal system for criminal offenses. Two measures were derived from official records: the total number of prior petitions to court and the age at first petition. In addition, official records were used to assess offending within each of the 6-month follow-up intervals.

At the baseline interview and each subsequent time point, an adapted version of the Self-Report of Offending Scale (SRO; Huizinga, Esbensen, & Weihar, 1991) was administered. Participants reported if they had been involved in any of twenty-two aggressive or income-generating crimes. Aggressive crimes involve person-to-person criminal activity (e.g., "Taken something from another person by force, using a weapon"). Income-generating crime involves offending that leads to financial gain for an individual (e.g., "Used checks or credit cards illegally"). These 22 items were asked at each time point with the qualifying phrase, "In the past 6 months, have you…" and the measure was found to be reliable in the current sample (alpha = .88 at baseline). Aggressive offending, income offending, and a total offending score were calculated; each score is a measure of the number of different types of crime an individual endorsed in a given recall period (e.g., a variety offending score). An examination of Kolmogorov-Smirnov goodness-of-fit tests revealed that SRO scores were non-normally distributed (there is a clustering of individuals at 0), warranting a square root transformation of these variables. Transformed SRO variables were used in all analyses described below.

Using both measures of offending behavior and because antisocial activity was assessed at each time point, we can uniquely identify three different variables of offending behavior: (a) prior offending which consists of offending behavior documented prior to the baseline interview, (b) short term assessments of offending based on offending in a 6 month recall period (self-report and official record), or (c) long-term offending based on the total amount of offending reported across the three years of the study (self-reported and official record).

Criminal Characteristics. Three variables were used as indices of criminal history: age at first arrest, early problem behavior onset, and paternal arrest history. Reviews of official court records were used to calculate the age at first arrest. If the juvenile's first offense was the one that made them eligible for study enrollment, the age at their initial referring petition was used for age of first arrest. Early behavior problems (Forth, et al., 2003) was assessed as a count of 5 different problem behaviors a youth endorsed having engaged in prior to age 11 (e.g., cheating, being drunk/stoned, or fighting). Participants also reported whether their father had been ever arrested.

IQ. The Wechsler Abbreviated Scale of Intelligence (WASI; Wechsler, 1999) was used to assess general intellectual ability based on two subtests: vocabulary (42 items that require the participant to orally define 4 images and 37 words present both orally and visually) and matrix reasoning (35 incomplete grid patterns that require the participant to select the correct response from five possible choices). The WASI is administered in approximately 15 minutes with higher scores indicating greater general intelligence and has been normed for participants from ages 6 to 89 years.

Neurological Deficits. This was assessed with two measures: the Stroop Color and Word Test and the Trail Making Test. The Stroop Color and Word Test (Golden, 1978) is used to examine the effects of interference on reading ability. The Stroop contains three parts: word page (the names of colors printed in black ink), color page (rows of X's printed in colored ink) and word-color page (the words from the first page are printed in the colors from the second page; however, the word meanings and ink colors are mismatched), each with 5 columns containing 20 items. The subject's task is to look at each sheet and move down the columns, reading words or naming the ink colors as quickly as possible, within a given time limit (45 seconds). To assess

neurological impairment a Color-Word Interference score below 40 suggests low level functioning such as: motor-speech problems, injury to the posterior left hemisphere, a disorder of the dominant temporal-occipital areas of the posterior right hemisphere, general prefontal pathology or emotional turmoil.

The Trails Making Test was the second measure of neuropsychological deficits. The Trails Making Test is a general measure of brain function and is utilized to assess the presence of brain damage (Reitan, 1979). The test has two parts: Part A involves a series of numbers and the participant is required to connect the numbers in sequential order (similar to a dot-to-dot). Part B involves a series of numbers and letters and the participant is required to alternately connect letters and numbers in sequential order. The test generally requires ability to sequence (Parts A and B), ability to shift cognitive set (Part B), and processing speed (Parts A and B). Part A and Part B are scored separately and expressed in terms of the number of seconds it takes the participant to complete each section. Longer completion times are indicative of a neurological deficit, such as attention issues, motor speed, difficulties in planning, and damage to the frontal lobe.

Peer Delinquency. Peer Delinquent Behavior was assessed by 19-items from the Rochester Youth Study (Thornberry et al., 1994). Two subscales were calculated: antisocial peer behavior (e.g., "How many of your friends have sold drugs?") and antisocial peer influence (e.g., "How many of your friends have suggested that you should sell drugs?"). Participants responded on a 5-point scale from “None of them” to “All of them”, with higher scores indicating more delinquent peer behavior and influence.

Parenting Style. Two separate measures were used to assess parental warmth and parental firmness. Parental warmth was assessed for mother/stepmother and father/stepfather separately

using a scale developed by Conger, Ge, Elder, Lorenz, and Simons (1994). Nine items assessed maternal and paternal warmth (e.g., ‘‘When you and your <parent> have spent time talking or doing things together how often did your <parent> act supportive and understanding toward you?’). Scores were averaged to get a total index of parental warmth. Second, parental firmness was measured using a scale adapted from Steinberg, Lamborn, Darling, Mounts, and Dornbusch (1994). Eight items assess parental firmness (e.g., ‘‘How often do you have a set time to be home on weekend nights?’’.

Based on paternal warmth and hostility, individuals were classified into 4 categories: authoritative parents (scored high on both warmth and firmness), permissive parents (scored high on warmth, low on firmness), authoritarian parents (scored low on warmth, high on firmness) and neglectful parents (scored low on warmth and firmness).

Substance Abuse. This was assessed using the Substance Use/Abuse Inventory (a modified version of a substance abuse measure utilized by Chassin et al., 1991). This 10-item measure assesses lifetime alcohol and illicit drug abuse and dependence (e.g., “Have you ever wanted a drink or drugs so badly that you could not think about anything else?”). A count of the number of items endorsed is used as a measure of substance dependency, higher numbers indicating greater alcohol or drug dependence.

Gang Involvement. Gang involvement was assessed by asking youths, “Were you ever in a gang?” At the baseline interview, 23.3% of youths endorsed gang membership.

Results

Analytic Plan

Analyses were designed to comparatively assess the total and facet scores of the PCL:YV, YPI, and NEO PRI for their (1) degree of overlap in assessing psychopathy, (2) utility

as a composite measure of psychopathy, (3) predictive utility for concurrent, short-, and long-term self-reported and official record offending, and (4) independent and composite ability to identify youths as psychopathic, who display deficits theoretically related to psychopathy. First, we identify individuals as psychopathic on each of the three variables using traditional cut-off scores for the PCL:YV and cut off scores based on standard deviations or, alternatively, derived from the receiver operating characteristic (ROC) analysis for the YPI and NEO PRI. Second, we use confirmatory factor analyses to create a composite model of psychopathy using all three measures. In the third step of analyses, we utilize multiple regression analyses to predict how psychopathic and non-psychopathic youth vary in offending behavior. Finally, we compare how youths identified as psychopathic by each of the three measures separately, as well as by all of the three measures, scored on a number of theoretically related covariates, as compared to non-psychopathic youths.

Measurement Overlap in Assessing Psychopathy

Means and standard deviations for each of the psychopathy measures (the PCL:YV, YPI, and NEO PRI) are provided in Table 1. In general, psychopathy measures were moderately correlated with one another (see Table 2), with stronger correlations between measures using analogous methods of assessment (self-report; NEO PRI and YPI). Next, we identified individuals who fell above and below traditional cut-off scores on each of the variables.

Insert Table 1 about here

Insert Table 2 about here

As noted previously, the typical cut-off score for psychopathy using the PCL-R (adult version) is 30, and no empirically derived cut scores are available for the PCL:YV (see Forth & Mailloux, 2000). Some researchers suggest that adopting the PCL-R threshold score of 30 for

diagnosing psychopathy would be reasonable (Forth et al., in press), while other researchers utilize a less stringent cut-off score of 25 in studies of juveniles. Consequently, the present study uses both cut-off scores. In this study 14.6% and 5.2% of boys scored above a PCL:YV cutoff of 25 and 30 respectively (see Table 3).

Insert Table 3 about here

Because the YPI and NEO PRI do not have set cut-off scores, we use two different methods of identifying individuals as psychopaths: cut-off points based on standard deviations and ROC analyses. Foremost, we identified youths who fell one and two standard deviations above the mean on the YPI and NEO PRI (see Table 3). When using a cut score of one standard deviation above the mean, 12.6% of boys were identified with the YPI and 13.2% of boys were identified with the NEO PRI as "psychopathic." When using a cut score of two standard deviations 2.0% of boys with the YPI and 2.8% of boys with the NEO PRI were classified as psychopathic.

The overlap between all three measures in classifying youth as "psychopathic" is also provided in Table 3. Cut scores of 25 on the PCL: YV were used to examine the overlap between all three psychopathy measures. For a cut score of one standard deviation above the mean for the YPI and NEO PRI, 15 boys (1.3%) were classified as "psychopathic" by all three measures. The likelihood of being classified as psychopathic by all three psychopathy measures was significantly greater than chance ($\chi 2$ (1, 116) = 5.11, $p < .05$). For a cut score of two standard deviations above the mean for the YPI and NEO PRI, 2 boys (0.2%) were classified as "psychopathic" by all three measures. The likelihood of being classified as psychopathic by all three psychopathy measures using this cut point was marginally greater than chance ($\chi 2$ (1, 27) = 3.86, $p = .05$).

In a second approach to determine cut scores on the YPI and NEO RPI, we conducted a receiver operating characteristic (ROC) analysis. ROC analyses identified cut scores for the YPI and NEO PRI that would maximize sensitivity and specificity in predicting PCL:YV scores. This approach is helpful for making comparisons with the juvenile psychopathy literature in which the PCL:YV is a more prevalent measurement instrument. ROC analyses calculate and plot the sensitivity (or true positive rate) by 1-specificity (or false positive rate) of a test at every possible threshold in predicting a criterion (Hanley & McNeil, 1982; Hsiao, Bartko & Potter, 1989; Metz, 1978; Mossman & Samoza, 1989, 1991; Murphy, Berwick & Weinstein, 1987; Vida, 1999). ROC analyses describe the predictive accuracy of a test across a range of possible threshold values, and are less dependent upon the base rates of psychopathy in a sample than are such traditional measures as correlation coefficients.

First, ROC analyses were performed for a PCL:YV threshold score of 30. The AUC, or area under the ROC curve, generated by the ROC may be interpreted as the probability of correctly distinguishing between a subject above the PCL:YV cut-off and a subject below the cut-off (see Table 4). The AUC was 0.68 ($p < .001$; SE = .04; CI = .60-.77) for the YPI, and 0.62 ($p < .01$; SE = .04; CI = .53-.70) for the NEO PRI. This indicated a 68% and 62% chance that a youth deemed psychopathic by the PCL:YV would score more highly than a randomly chosen youth not deemed psychopathic, on the YPI and NEO PRI respectively. Examination of the sensitivity and specificity of the range of YPI total scores for predicting PCL:YV status as "psychopathic" indicated that a threshold of approximately 121.5 yields an optimal balance between the true positive rate (sensitivity = .65) and the false positive rate (1 minus specificity = .28) of the YPI in predicting PCL:YV psychopathy in this sample. An appropriate cut score

could not be established for the NEO PRI as ROC analyses revealed poor sensitivity and specificity of this measure in predicting PCL:YV in this sample.

Insert Table 4 about here

This analysis was repeated for a PCL:YV cut score of 25 and results are also presented in Table 4. The AUC was 0.66 ($p < .001$; SE = .03; CI = .61-.71) for the YPI total score and 0.63 ($p < .001$; SE = .03; CI = .57-.68) for the NEO PRI. For this analysis, the optimal balance between the true positive rate (sensitivity = .65) and the false positive rate (1 minus specificity = .36) of the YPI in predicting PCL:YV psychopathy yielded a cut point of 115.5. Based on the two YPI cutoff scores of 121.5 and 115.5, obtained from ROC analyses, 24 boys (2.0%) and 388 boys (33.1%) were classified as psychopathic, respectively.

Composite Model of Psychopathy

To further understand the overlap among the three measures and test whether a global construct of psychopathy could be derived, a confirmatory factor analysis (CFA) was conducted. For this model, all facets of the three psychopathy variables were set to load onto a single latent construct. PCL:YV at baseline, YPI at 24 months, and NEO PRI at 24 months were included in this model.[2] A good fit was determined by values of the Comparative Fit Index (CFI; Bentler, 1990) above .95. A Root Mean Square Error of Approximation (RMSEA) below .05 indicates a very good model, a value of .08 indicates adequate fit, and a value above .10 indicates poor model fit (Browne & Cudeck, 1993). According to these criteria, the results of this analysis revealed a poor fit to the data with this composite model ($df = 20$, $\chi^2 = 1144.4$, CFI=.61, RMSEA=.22). Given the poor fit of this model, a second composite model was tested in which the NEO and YPI facets loaded onto a single latent construct, which was correlated with the PCL:YV latent variable (see Figure 1). This two-factor model resulted in a good fit to the data

(df =19, χ^2 =124.3, CFI=.97, RMSEA=.07). As such, this suggests that the three measures cannot be combined into a single score.

Insert Figure 1 about here

Psychopathy and Recidivism: The Predictive Utility of the PCL:YV, YPI, and NEO-PRI

In order to compare the predictive utility of the PCL:YV, YPI, and NEO PRI, offending at the 36-month assessment (self-reported total offending, aggressive offending, and income offending, and official-record offending) was regressed on these three measures. These analyses controlled for age, number of days spent in confinement, and lifetime history of offending at baseline (see Table 5). YPI and NEO PRI made independent contributions to total self-reported offending at 36 months, PCL:YV did not. Neither PCL:YV nor YPI were associated with aggressive, income, and official-record offending. NEO PRI, on the other hand, was significantly associated with aggressive and income offending at 36 months. Because the PCL:YV was assessed at baseline, whereas YPI and NEO PRI were assessed at 24 months, this model specified a 1-year prediction for the YPI and NEO PRI but a 3-year prediction for the PCL:YV, demanding a more distant prediction for the PCL:YV. This may have accounted for the PCL:YV's failure to predict offending at 36 months. Indeed, bivariate correlation coefficients for PCL-YV scores at baseline with total self-reported offending scores at month 6 through month 36 assessments showed gradual attenuation: $r_{\text{SRO 6 months}} = .32$, $p < .001$; $r_{\text{SRO 12 months}} = .29$, $p < .001$; $r_{\text{SRO 18 months}} = .26$, $p < .001$; $r_{\text{SRO 24 months}} = .24$, $p < .001$; $r_{\text{SRO 30 months}} = .26$, $p < .001$; and $r_{\text{SRO 36 months}} = .21$, $p < .001$.

Insert Table 5 about here

The next set of regression analyses avoided the problem of non-concurrent assessments across the three measures of psychopathy by comparing the predictive utility of the PCL:YV,

YPI, and NEO PRI in separate regression models that predicted offending 6 months and 12 months later (Table 6). All three measures of psychopathy were significantly associated with total self-reported offending 6 and 12 months later, aggressive and income offending at 6 months, and official-record offending at 12 months and that association was similar in magnitude across the three measures, as indicated by semi-partial correlations. There were a few differences among the scales – i.e., unlike other scales, YPI was not predictive of income offending at 12 months, but was predictive of official-record offending at 6 months. Among the subscales of the PCL:YV, only the behavioral subscale was a significant predictor of offending 6 months later (see Model 1 in Table 7). For the YPI, the grandiose-manipulative dimension was the only significant predictor of total self-reported offending 6 months later (see Model 2 in Table 7).[4]

Insert Table 6 about here

Insert Table 7 about here

Differences Between High versus Low Scoring Youths on Measures of Psychopathy

In order to understand what factors differentiated youth scoring above the threshold on the three psychopathy measures, we compared them with nonpsychopathic youth on a number of theoretically meaningful variables. Two groups were created for each psychopathy measure: PCL:YV, YPI (Month 6), and NEO PRI, with one group scoring one standard deviation *below* the mean for that scale (comparison group) and the other scoring one standard deviation *above* the mean (psychopathy group). Also, combining across all measures, two groups were created by taking all youth scoring *below* the 1 SD threshold on all three measures (comparison group) and all youth scoring *above* the 1 SD threshold on all three measures (psychopathy group; $n = 20$). A series of t-tests were performed to compare these groups on continuous variables: age at first prior; count of early onset behavior problems; offending; neuropsychological and executive

functioning (e.g., IQ, Stroop, Trail-making test); and peer delinquency. A series of chi-square analyses were performed to compare groups on dichotomous variables: ethnicity; parenting style; paternal arrest/ incarceration; drug abuse and dependency; and gang involvement. These results are presented in Tables 8 and 9.

Insert Table 8 about here

Insert Table 9 about here

For all three measures individually and combined, the high psychopathy group was significantly higher than the comparison group on most measures. Specifically, youth meeting threshold for psychopathy, whether assessed by the PCL:YV, YPI, NEO, or a combination of all three measures, presented with more early behavior problems, a greater frequency and variety of offending, higher IQ, greater color-word interference on the Stroop task, greater peer delinquency, and they were more likely to have a diagnosis of drug abuse and dependency. When comparing groups for the PCL: YV alone and the YPI alone, high psychopathy youth were also younger at their first prior offense, more likely to have a biological father that was arrested or jailed, had experienced neglectful parenting, and been involved in a gang (see Table 8). When comparing groups for the NEO alone, high psychopathy youth were more likely to have a biological father that was arrested or jailed and they displayed differences in performance on the trail-making task. Youth meeting threshold on all three measures were also more likely to be involved in a gang compared with comparison youth (see Table 9).

Discussion

In recent years, several different measures of psychopathy have been developed in an effort to assist in the identification of psychopathic traits among youthful offenders. In the present study, we considered three such measures, each of which employs a significantly

different method of assessment from one another. We examined the relations between these different measures, to assess the degree of overlap between them and their utility as a combined index of psychopathy, and we compared their merits as potential predictors of both short- and long-term subsequent delinquent behavior.

The results of the present analyses indicate that there is a modest degree of overlap between the PCL:YV (the putative "gold standard"; a measure based on a structured interview of the subject and a collateral, as well as a review of official records), the YPI (a self-report measure), and the NEO (in which self-report data on several personality domains is used to derive a psychopathy resemblance indicator). Resultant *r* values for the total scores ranged from .26 to .36, with the highest correlations for YPI with either PCL:YV or NEO. Overlap in the present study between the PCL:YV and the YPI are consistent with other studies that find moderate overlap (Dolan & Rennie, 2006; Skeem & Cauffman, 2003), however, this is the first known study to examine the NEO-PRI in an adolescent sample (Lynam, 2007, personal communication) and thus the first to document that the NEO-PRI shows modest overlap with both the PCL:YV and the YPI. While the likelihood of being classified as psychopathic by all three measures was significantly greater than chance, only 1% of youth met the cutoff on all three scales (compared with 13-15% of youth scoring above the cut-off on any one scale considered individually). In addition, a global construct of psychopathy could not be derived via confirmatory factor analysis using all three measures, suggesting that these three measures are not reflective of a common underlying construct. The disparity of the factor structures of the different measures suggests that they each operationalize "psychopathy" differently. In some respects, this is naturally expected, since, for example, the PCL:YV contains a significant behavioral component, whereas the other two measures do not. Moreover, among youths above

the PCL:YV clinical cut-off score of 30, 68% of the time they would score higher than average on the YPI and 62% of the time they would score higher than average on the NEO-PRI. Alternatively, 32% and 38% of the time, youths who score high on the PCL:YV would score average (or lower) on the two other measures of psychopathy. That a youth could be identified as psychopathic on one measure of psychopathy, but frequently not so on other measures, raises concerns about the validity of the measures.

Given the modest degree of overlap between the three assessment tools employed, we anticipated significant differences in their utility for predicting recidivism. Although variations in the longitudinal time points at which different measures were administered made some comparisons problematic, we were nevertheless able to draw several useful conclusions. For example, our findings indicate that the PCL:YV was unable to predict self-reported offending three years later. This finding is similar to that of Edens and Cahill (2007), who also found no such relationship in a 10-year prospective study of recidivism using the PCL:YV. Thus, while the PCL-R may be predictive of offending among adults (at least when evaluated retrospectively, which raises tautological concerns as noted elsewhere; Glover, Nicholson, Hemmati, Bernfield & Quinsey, 2002; Harris, Rice, & Cormier, 1992; Hemphill, Hare & Wong, 1998; Serin, 1996) and the PCL:YV may be predictive of short-term offending (Corrado et al., 2004; Falkenbach et al., 2003; Forth, Hart, & Hare, 1990; Skeem & Cauffman, 2003), it is not clear that such a relation applies to juveniles for follow-up periods exceeding three years. Notably, the self-report based measures (YPI, NEO-PRI) performed comparably well in predicting subsequent offending over the short-term, compared with the more time-consuming and skill-intensive interview measure (PCL:YV).

Because of concerns about the developmental appropriateness of evaluating a supposedly stable personality trait during adolescence (Edens, Skeem et al. 2001; Seagrave and Grisso 2002), we would expect the predictive utility of psychopathy measures to be strongest for more proximal assessments. We thus examined the correlations of all three measures with self-reported offending for both 6- and 12-month periods following administration of the psychopathy assessments. Our findings indicate that all three measures were indeed correlated with self-reported offending during the subsequent 6 and 12 month follow-up periods, although the magnitude of such correlations was weak. For the official-records offending, all three scales had considerably weaker predictive power, with only YPI having significant association with offending over the next 6 months and all three scales having significant but weak association with the official records offending over the next year. One possibility is that psychopathy, as measured by these three measures, is associated not only with offending, but also with the likelihood of getting away with a crime – a claim that is consistent with our finding that youths scoring in psychopathic range had higher IQ.

Interestingly, closer examination revealed that the observed correlations were due primarily to the behavioral subscale of the PCL:YV, and the grandiose-manipulative dimension of the YPI. The relation between the behavioral dimension of the PCL:YV and subsequent short-term offending is a natural consequence of the predictor-criterion overlap for this measure. The lack of correlation between the affective and interpersonal subscales of the PCL:YV and subsequent behavior, even in the short term, suggests that any predictive utility inherent in the overall measure is driven by the behavioral component, rather than by the core personality traits. The finding that the Interpersonal (grandiose-manipulative) scale on the YPI was the most predictive of subsequent self-reported offending is also of interest because, of the three YPI

domains (Affective, Interpersonal, and Lifestyle/Behavioral), one might expect offending behavior to be a stronger function of behavioral and affective characteristics, rather than interpersonal characteristics as observed.

Interestingly, the baseline PCL:YV score is correlated (albeit weakly) with the NEO at the 24-month follow-up, but not with offending at that time point. Although counterintuitive, in that psychopathy would be expected to be associated with offending behavior, such data are qualitatively consistent with previous research showing that personality traits tend to coalesce, but do not become stable until late adolescence or early adulthood (Seagrave & Grisso, 2002), and studies suggesting that the predictive utility of psychopathy measures in adolescents may be short-term (Edens & Cahill, 2007). To the extent that some researchers have suggested that the PCL:YV may capture elements of normative psychosocial immaturity among adolescents (e.g., impulsivity and need for stimulation, Forth & Burke, 1998), it is also possible that decreases in the predictability are due to some youths with high psychopathy maintaining trait-like characteristics of psychopathy and other youths with high psychopathy decreasing in characteristics of psychopathy due to increases in psychosocial maturity.

Furthermore, comparisons between youths with the highest and lowest psychopathy scores revealed several interesting patterns. While we did not find strong overlap among the three psychopathy measures, all three measures clearly identified differences between those who scored high and those who scored low. Those with higher scores tended to report more early behavior problems, a wider range of past offending behaviors, and more frequent drug use. They also exhibited greater color-word interference, which may be indicative of poor prefrontal functioning, but higher IQ. For the PCL:YV and YPI (but not the NEO), the higher-scoring groups also tended to have started offending at younger ages and were more likely to belong to a

gang, to report parental neglect, and to have biological fathers who had been arrested or jailed. In general, this pattern of findings is consistent with many theoretical and behavioral constructs that are theoretically related to psychopathy (e.g., Campbell, Porter & Santor, 2004; Vidling, 2004). Importantly, while we do find that youths identified as psychopathic tend to possess greater IQ than non-psychopathic youth, it should be noted that in the present sample, the average IQ score is quite low (mean = 85, *SD* = 13). Thus, while these scores are higher relative to the current sample, this is not to say that these youths possess greater IQ with respect to the population average on IQ (mean = 100, *SD* = 15).

Despite the unique contributions of this study, there are several limitations worth noting. First, analyses were conducted using a purely male sample of juvenile offenders, so results may not apply to female and/or non-incarcerated populations. Second, the NEO, YPI, and offending measures rely on self-report, possibly resulting in a higher co-variance due to the shared method of data collection as compared with the PCL:YV, which relied on interview, collateral, and official records. To address this concern, we used both self-report and official records to strengthen our findings, and patterns of findings are comparable regardless of the method of assessing psychopathy. Finally, the measures of psychopathy were administered at differing time points throughout the period of study. Specifically, the PCL:YV was administered at baseline (and was not re-assessed), the YPI was administered at the 6-month follow-up (and then re-assessed at each subsequent time point), and the NEO was not assessed until the 24-month follow-up (and was not re-assessed). Thus, while we were able to compare YPI and NEO scores at a common time-point, comparisons of the PCL:YV and YPI included a 6-month lag, and comparisons of the PCL:YV and NEO included a 24-month lag. However, even with this lagged pattern of assessment, it should be noted that the findings of the present study closely mirror

studies that used a single assessment time point in predicting short-term offending behavior (Catchpole & Gretton, 2003; Corrado et al., 2004; Falkenbach et al., 2003; Forth, Hart et al. 1990); Gretton et al., 2001, 2004; Skeem & Cauffman, 2003; Toupin et al., 1995). Despite these limitations, however, this study allows for useful comparisons among disparate measures of psychopathic traits, so long as these comparisons are drawn with sufficient care.

The key conclusion to be drawn from this study, however, is that while adolescent offenders' scores on disparate psychopathy measures are correlated with subsequent offending behavior in the short-term, such correlations are weak, and diminish with time. Thus, scores on measures of psychopathy may be useful indicators of the need for subsequent monitoring in the short-term, but do little to differentiate between those who are or are not long-term recidivists. Accordingly, the fact that a youth could be identified as psychopathic on one measure of psychopathy, but not consistently on other measures of psychopathy, raises concerns about the validity of these measures for making legal or clinical treatment decisions. As such, it appears inappropriate to rely on such measures as a basis for whether a juvenile defendant should be tried or sentenced as an adult, or should be viewed as incorrigible or incapable of rehabilitation.

Table 1:

Distributions for the PCL:YV, NEO-PRI, and YPI

	Mean (SD)	Skewness	Kurtosis	Minimum/ Maximum
PCL Total Score (Baseline)	16.12 (7.77)	.25	-.60	0 – 39
Interpersonal	2.32 (2.00)	.94	.64	0 – 12
Affective	2.76 (2.07)	.60	-.01	0 – 11
Lifestyle	4.55 (2.42)	.29	-.19	0 – 14
Behavioral	5.09 (2.51)	.08	-.88	0 – 13
YPI Total Score (Month 6)	109.86 (23.13)	.06	-.08	42 – 191
Grandiose-Manipulative	40.43 (11.71)	.28	-.32	12 – 80
Callous-Unemotional	33.77 (6.81)	.25	.28	7 – 58
Impulsive-Irresponsible	35.66 (8.24)	.00	-.26	15 – 60
NEO-PRI (Month 24)	.01 (.17)	.25	.03	-.49 - .59

Note: PCL = Psychopathy Checklist: Youth Version; YPI = Youth Psychopathy Inventory.

Table 2:
Correlations between total and facet scores of the PCL:YV, NEO PRI, and YPI

	Total PCL Score	PCL - Interpersonal	PCL - Affective	PCL - Lifestyle	PCL - Behavioral
YPI - Total Score - 6M	**.346*** **	.294***	.278***	.267***	.259***
YPI - Grandiose-Manipulative Dimension - 6M	.290***	*.305***	.239***	.204***	.179***
YPI - Callous-Unemotional Dimension - 6M	.319***	.216***	*.289***	.251***	.250***
YPI - Impulsive-Irresponsible Dimension - 6M	.294***	.211***	.199***	*.252***	.265***
NEO-PRI	**.255*** **	.240***	.142***	.187***	.226***

	NEO-PRI
YPI - Grandiose-Manipulative Dimension - 24M	.327***
YPI - Callous-Unemotional Dimension - 24M	.349***
YPI - Impulsive-Irresponsible Dimension - 24M	.277***
YPI - Total Score - 24M	**.361*** **

Note: PCL = Psychopathy Checklist: Youth Version; YPI = Youth Psychopathy Inventory; NEO-PRI = NEO Psychopathy Resemblance Index; *** $p < .001$.

Table 3:

Cut-offs and overlap for the PCL:YV, NEO-PRI, and YPI

Measure criteria	Cut-off criteria score	N (%) above cut-off	N (%) above cut-off on all measures*
Standard cut-offs			
PCL Total Score (Baseline)	25	171 (14.6%)	-
PCL Total Score (Baseline)	30	61 (5.2%)	-
Cutoff: 1 SD above mean			
YPI Total Score (Month 6)	133.00	148 (12.6%)	15 (1.3%)
NEO-PRI (Month 24)	.18	155 (13.2%)	
Cutoff: 2 SD above mean			
YPI Total Score (Month 6)	156.12	24 (2.0%)	2 (0.2%)
NEO-PRI (Month 24)	.35	33 (2.8%)	

Note: PCL = Psychopathy Checklist: Youth Version; YPI = Youth Psychopathy Inventory; NEO-PRI = NEO Psychopathy Resemblance Index. Dashes indicate term that was not calculated. *Overlap between measures is based on a cut score of 25 on the PCL:YV.

Table 4:

Area under the ROC curve for the YPI and NEO-PRI

Measure	AUC	SE	CI
Threshold: PCL > 30			
YPI	.68***	.04	.60 - .77
NEO-PRI	.62**	.04	.53 - .70
Threshold: PCL > 25			
YPI	.66***	.03	.61 - .71
NEO-PRI	.63***	.03	.57 - .68

Note: PCL = Psychopathy Checklist: Youth Version; YPI = Youth Psychopathy Inventory;

NEO-PRI = NEO Psychopathy Resemblance Index. **p<.01; ***p<.001.

Table 5: *Regression Analyses Predicting Offending at 36 Months using the PCL:YV, YPI, and NEO* [a, b]

Variable	β	t	r_{part}	Tolerance
Model 1 – Total self-reported offending on:				
PCL:YV	.01	.15	.01	.62
YPI	.11**	2.65	.10	.79
NEO-PRI	.14**	3.40	.13	.79
Model 2 – Self-reported aggressive offending on:				
PCL:YV	.04	.91	.03	.76
YPI	.08	1.78	.07	.80
NEO-PRI	.13**	3.14	.12	.80
Model 3 – Self-reported income offending on:				
PCL:YV	.06	1.32	.05	.76
YPI	.08	1.89	.07	.80
NEO-PRI	.14*	3.27	.12	.81
Model 4 – Official-record offending on:				
PCL:YV	.05	1.00	.04	.62
YPI	.08	1.81	.07	.79
NEO-PRI	-.03	-.75	-.03	.79

Note: * $p < .05$, *** $p < .001$.

[a] PCL:YV measured at baseline, whereas 24-month measures of the YPI and NEO-PRI were used to predict SRO at 36 months.

[b] Age, days in confinement (baseline-36 months), lifetime offending reported at baseline, and race were controlled for prior to entering the three psychopathy measures into the model.

[c] A value of tolerance less than .10 indicates possible multicollinearity problems.

Table 6: *Regression Analyses Predicting Short-term Offending (6 Months) and Long-term Offending (1Year) using the PCL:YV, YPI, and NEO-PRI* [a]

	6-month prediction of offending[b]			1-year prediction of offending[c]		
	β	t	r_{part}	β	T	r_{part}
Total self-reported offending on:						
Model 1 – PCL:YV (baseline)	.20***	5.97	.18	.18***	5.13	.16
Model 2 – YPI (24 months)	.14***	4.31	.13	.08**	2.66	.08
Model 3 – NEO-PRI (24 months)	.17***	5.43	.16	.10**	3.22	.10
Self-reported aggressive offending on:						
Model 1 – PCL:YV (baseline)	.21***	6.35	.19	.19***	5.58	.17
Model 2 – YPI (24 months)	.08*	2.52	.07	.05	1.64	.05
Model 3 – NEO-PRI (24 months)	.15***	4.79	.14	.07*	2.18	.07
Self-reported income offending on:						
Model 1 – PCL:YV (baseline)	.25***	7.48	.23	.23***	6.57	.20
Model 2 – YPI (24 months)	.10**	3.03	.09	.06	1.72	.05
Model 3 – NEO-PRI (24 months)	.17***	5.34	.16	.08*	2.35	.07
Official-records offending on:						
Model 1 – PCL:YV (baseline)	.06	1.58	.05	.08*	2.30	.07
Model 2 – YPI (24 months)	.08*	2.28	.08	.11**	3.33	.11
Model 3 – NEO-PRI (24 months)	.04	1.08	.04	.07*	1.98	.07

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

[a] Age, days in confinement (within the period under study), offending reported before the period under study, and race were controlled for prior to entering the psychopathy measures into the models.

[b] A baseline measure of the PCL:YV predicted offending at 6 months for Model 1 and the 24-month measures of YPI and NEO-PRI predicted offending at 30 months for Models 2 and 3.

[c] A baseline measure of the PCL:YV predicted offending at 12 months for Model 1 and the 24-month measures of YPI and NEO-PRI predicted offending at 36 months for Models 2 and 3.

Table 7: *Regression Analyses Predicting Short-term Offending (6 Months) using the subscales of the PCL:YV and YPI* [a]

	Total self-reported offending[b]			Self-reported aggressive offending[b]			Self-reported income offending[b]			Official-records offending[b]		
	β	t	r_{part}	β	t	r_{part}	β	t	r_{part}	β	t	r_{part}
Model 1 – PCL:YV subscales (baseline)												
Interpersonal	.04	1.01	.03	.03	.80	.02	.03	.68	.02	-.02	-.53	-.02
Affective	.02	.42	.01	.03	.84	.03	.04	1.06	.03	-.01	-.18	-.01
Lifestyle	.02	.50	.02	.01	.28	.01	.02	.38	.01	.07	1.64	.05
Behavioral	.19***	4.71	.14	.20***	4.88	.15	.25***	6.00	.18	.03	.64	.02
Model 2 – YPI dimensions (24 months)												
Grandiose-Manipulative	.14**	3.22	.09	.05	1.16	.03	.05	1.14	.04	-.01	-.11	.00
Callous-Unemotional	-.05	-1.26	-.04	-.02	-.12	.00	.01	.13	.00	.02	.52	.02
Impulsive-Irresponsible	.05	1.20	.04	.04	.93	.03	.05	1.15	.04	.07	1.49	.05

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

[a] Age, days in confinement (within the period under study), offending reported before the period under study, and race were controlled for prior to entering the psychopathy measures into the models.

[b] A baseline measure of the PCL:YV predicted offending at 6 months for Model 1 and a 24-month measure of YPI predicted offending at 30 months for Model 2.

Table 8:
High/ Low Psychopathy Group Comparisons for the PCL: YV and YPI

Outcome	PCL: YV Groups		Sig.	YPI Groups		Sig
	< 1 SD	> 1 SD		< 1 SD	> 1 SD	
Ethnicity (%) -White -Black -Hispanic -Other	 19 41 37 3	 20 42 33 5	χ^2 =1.63	 14 49 34 4	 21 41 30 7	χ^2 =4.96
Age First Prior	14.78 (1.49)	13.95 (1.68)	*t* = 5.17***	14.08 (1.59)	14.49 (1.63)	*t* = -2.21*
Count- Early Behavior Problems	1.02 (.96)	2.11 (1.33)	*t* = -9.27***	1.20 (1.12)	1.97 (1.21)	*t* = -5.88***
Variety of offending over time	.03 (.04)	.13 (.10)	*t* = -12.72***	.04 (.05)	.13 (.12)	*t* = -8.06***
Frequency of offending over time	21.19 (90.50)	86.31 (162.87)	*t* = -4.68***	22.98 (80.62)	65.59 (110.00)	*t* = -3.82***
IQ	84.13 (12.30)	85.50 (13.70)	*t* = -1.04	82.22 (12.21)	85.21 (13.25)	*t* = -2.06*
-Matrix Reasoning	42.30 (10.90)	42.06 (11.40)	*t* = .22	41.01 (11.45)	41.49 (11.84)	*t* = -.36
-Vocabulary	78.99 (16.98)	81.06 (18.69)	*t* = -1.15	76.23 (17.40)	80.59 (18.53)	*t* = -2.15*
Stroop Color-Word interference	36.08 (5.94)	37.46 (6.47)	*t* = -2.20*	35.32 (6.20)	37.32 (5.73)	*t* = -2.96*
Trails B (sec)	75.05 (37.02)	76.39 (31.18)	*t* = -.38	84.41 (36.82)	75.04 (32.29)	*t* = 2.39*
Peer Antisocial behavior	1.78 (.78)	2.90 (.93)	*t* = -12.62***	1.98 (.88)	2.79 (.97)	*t* = -7.58***

Peer Antisocial influence	1.34 (.54)	2.26 (1.04)	t = -10.84***	1.47 (.71)	2.21 (1.04)	t = -7.19***
Biological father arrest or jail (%)	32	51	χ^2 =10.76***	35	50	χ^2 =5.71*
Parenting Style -Authoritative -Indulgent -Authoritarian -Neglectful	 51 12 18 18	 13 28 13 45	χ^2 =33.18***	 45 24 12 18	 26 26 13 35	χ^2 =6.46
Drug abuse	12	38	χ^2 =35.41***	16	27	χ^2 =5.10*
Drug dependency	0	28	χ^2 =63.20***	6	25	χ^2 =21.47***
Gang Involvement (%)	9	39	χ^2 =50.02***	19	28	χ^2 =3.47$^+$

Note: PCL:YV = Psychopathy Checklist: Youth Version; YPI = Youth Psychopathy Inventory.

$^+ p$ <.10 ,* p < .05, *** p < .001.

Table 9:
High/ Low Psychopathy Group Comparisons for the NEO-PRI and All Measures Combined

Outcome	NEO-PRI Groups		Sig.	All measures Groups		Sig
	< 1 SD	> 1 SD		< 1 SD	> 1 SD (*n*=20)	
Ethnicity (%) -White -Black -Hispanic -Other	 14 35 47 5	 28 39 28 5	χ^2 =16.63***	 18 41 37 4	 20 45 35 0	χ^2 =1.02
Age First Prior	14.48 (1.61)	14.29 (1.73)	*t* = 1.08	14.57 (1.60)	14.90 (1.62)	*t* = -.90
Count- Early Behavior Problems	1.30 (1.20)	1.84 (1.16)	*t* = -4.21***	1.36 (1.10)	2.45 (1.15)	*t* = -4.18***
Variety of offending over time	.05 (.06)	.14 (.10)	*t* = -9.19***	.05 (.06)	.18 (.13)	*t* = -4.32***
Frequency of offending over time	20.64 (67.36)	86.86 (178.71)	*t* = -4.38***	39.17 (129.84)	93.74 (122.04)	*t* = -1.96^{+}
IQ	82.38 (14.16)	87.74 (12.95)	*t* = -3.61***	84.58 (12.88)	88.60 (10.91)	*t* = -1.61
-Matrix Reasoning	40.97 (12.02)	43.31 (11.41)	*t* = -1.82	42.64 (11.23)	43.90 (9.85)	*t* = -.56
-Vocabulary	76.02 (19.62)	82.38 (87.74)	*t* = -4.12***	79.47 (17.83)	85.15 (15.36)	*t* = -1.61
Stroop Color-Word Interference	35.97 (6.32)	38.97 (6.54)	*t* = -4.23***	36.30 (6.24)	38.75 (5.11)	*t* = -2.08*
Trails B (sec)	82.65 (35.20)	71.98 (29.43)	*t* = 3.0**	79.98 (36.59)	74.79 (21.93)	*t* = .98
Peer Antisocial behavior	2.17 (.94)	2.79 (.87)	*t* = -6.20***	2.14 (.88)	3.39 (.78)	*t* = -6.83***
Peer Antisocial influence	1.66 (.86)	2.03 (.93)	*t* = -3.80***	1.65 (.79)	2.76 (1.00)	*t* = -4.78***
Biological father arrest or jail (%)	35	52	χ^2 =8.14**	40	47	χ^2 =.31
Parenting Style -Authoritative -Indulgent -Authoritarian -Neglectful	 33 23 15 28	 23 26 16 35	χ^2 =1.89,	 31 22 23 25	 14 57 14 14	χ^2 =4.72
Drug abuse	21	33	χ^2 =5.78*	21	30	χ^2 =1.00

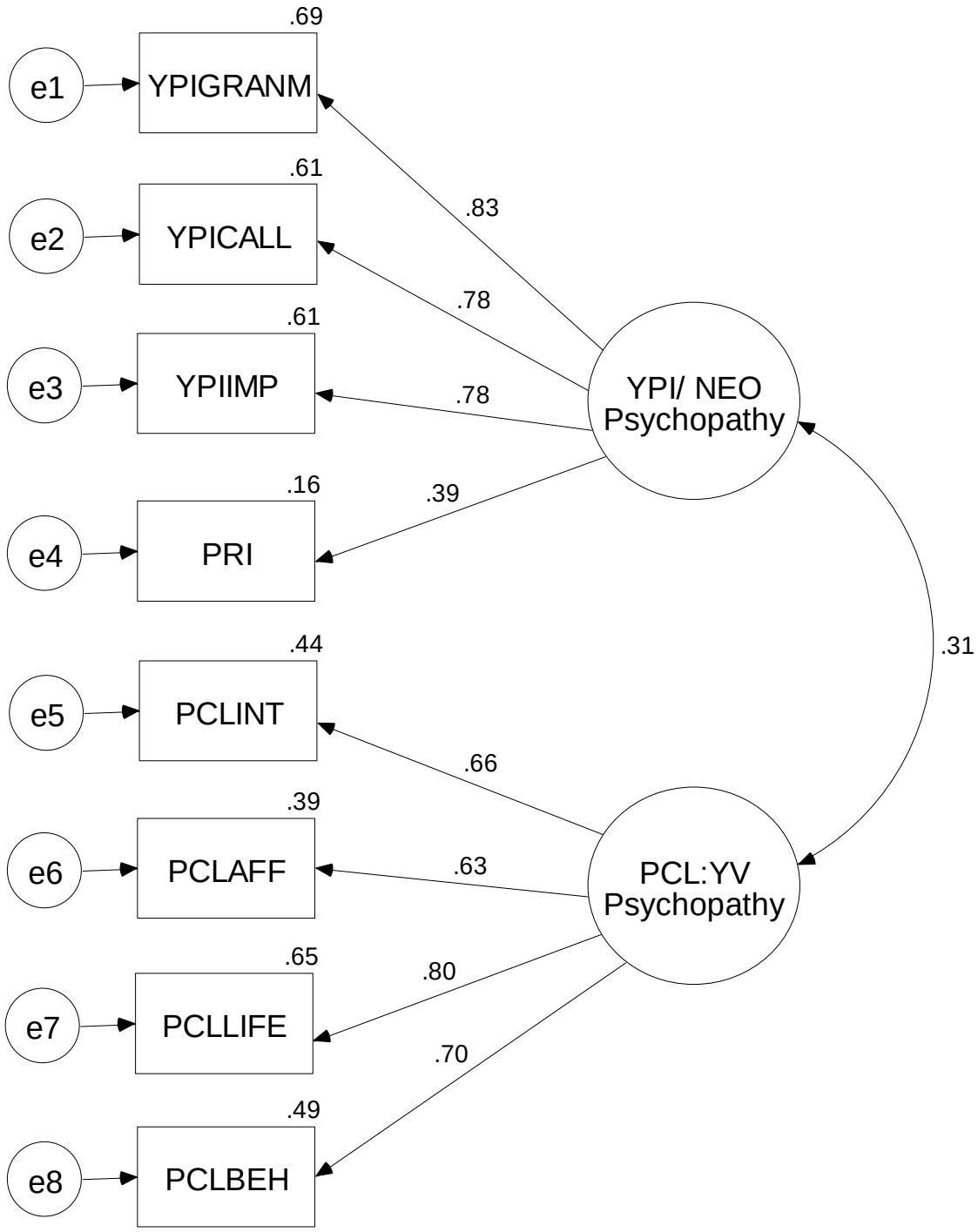
Drug dependency	11	22	χ^2 =7.57*	12	40	χ^2 =13.81***
Gang Involvement (%)	27	28	χ^2 =.03	20	40	χ^2 = 4.54*

Note: NEO-PRI = NEO Psychopathy Resemblance Index.

Figure Caption

Figure 1:

Two-factor composite model of psychopathy including the NEO-PRI, YPI, and PCL: YV facet scores with factor loadings


.69
e1
YPIGRANM
.61
e2
YPICALL
.61
e3
YPIIMP
.16
e4
PRI
.44
e5
PCLINT
.39
e6
PCLAFF
.65
e7
PCLLIFE
.49
e8
PCLBEH
.83
.78
.78
.39
.66
.63
.80
.70
YPI/ NEO
Psychopathy
PCL:YV
Psychopathy
.31

Footnote

[1] Court record data was unavailable for 401 participants (34% of the sample). For these youths, interviewers completed the PCL-YV relying on only interview data and collateral report. In addition, there were 104 (7.6%) participants who were not scored on the PCL: YV and could not be included in the analyses.

[2] As a reminder, the PCL:YV was only conducted at baseline. As such, we did a 24-month comparison for this model.

[3] An alternative set of models was tested to examine whether the Behavioral subscale of the PCL:YV was responsible for the poor single-factor model fit. However, a single-factor model with the 3 subscales of the PCL:YV (interpersonal, affective, and lifestyle, but not behavioral), 3 YPI dimensions, and the PRI score also had a poor fit: χ^2 (14) = 719.32, $p < .001$; CFI = .605, RMSEA = .208.

[4] Because self-reported offending (SRO) scores exhibited a decline in means and standard deviations throughput the study: M=.15, SD=.16 at baseline and M=.05 and SD=.10 at 36 months, a separate set of logistic regressions were performed with a dichotomized SRO outcome. Results of these analyses were similar to the ones obtained with the continuous measure of offending. When tested in one model, the YPI and NEO-PRI were significantly associated with offending at 36 months, whereas the PCL:YV was not. All three measures were significantly associated offending 6 months and 12 months later.

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