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Longitudinal Evidence that Psychopathy Scores in Early Adolescence Predict Adult Psychopathy

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Abstract

The present study examines the relation between psychopathy assessed at age 13 using the mother-reported Childhood Psychopathy Scale (Lynam, 1997) and psychopathy assessed at age 24 using the interviewer-rated Psychopathy Checklist: Screening Version (PCL:SV; Hart, Cox, and Hare, 1995). Data from over 250 participants of the middle sample of the Pittsburgh Youth Study were used to examine this relation; approximately 9% of the sample met criteria for a possible PCL:SV diagnosis. Despite the long time-lag, different sources, and different methods, psychopathy from early adolescence into young adulthood was moderately stable, $r = 0.31$. The relation was present for the PCL:SV total and facet scores, was not moderated by initial risk status or initial psychopathy level, and held even after controlling for other age-13 variables. “Diagnostic” stability was somewhat lower. Specificity and negative predictive power were both good, sensitivity was adequate, but positive predictive power was poor. This constitutes the first demonstration of the relative stability of psychopathy from adolescence into adulthood and provides evidence for the incremental utility of the adolescent psychopathy construct. Implications and future directions are discussed.

Keywords

adolescent psychopathy; Childhood Psychopathy Scale; chronic offending; longitudinal

Since Robins' (1966) work on the adult outcomes of antisocial children, researchers have recognized the need to parse the heterogeneity in the group of children with conduct problems. Recently, the construct of psychopathy has been borrowed from the adult literature in an attempt to discriminate those children with conduct problems who will become chronic offenders, specifically psychopathic offenders, from those whose antisocial behavior will subside over time (Frick, O'Brien, Wootton, & McBurnett, 1994; Lynam, 1996, 1997). Psychopathy is a personality disorder characterized by a lack of remorse,

manipulativeness, egocentricity, superficial charm, impulsivity, unreliability, and shallow affect (Cleckley, 1941; Hare, 2003).

The psychopathic offender is among the most prolific, versatile, and violent of offenders. For example, Porter, Birt, and Boer (2001) examined the association between psychopathy and crime among a relatively large sample of male offenders; psychopathic offenders, compared to nonpsychopathic offenders, committed a greater variety of offenses, as well more offenses of any type. Similarly, Brinkley, Schmitt, Smith, and Newman (2001) found moderate correlations between psychopathy scores and violent and nonviolent criminal activity across both African-American and white subsamples. Moreover, the violence committed by psychopathic offenders tends to be more instrumental and “cold-blooded” than the violence committed by nonpsychopathic offenders (Woodworth & Porter, 2002).

Psychopathic offenders are relatively resistant to efforts at rehabilitation through incarceration. Multiple prospective studies have demonstrated that psychopathic offenders are more likely to commit institutional infractions while incarcerated. In a recent meta-analysis, Guy, Edens, Anthony, and Doulgas (2005) examined the relations between psychopathy scores and several categories of institutional misconduct. These authors reported moderate relations between psychopathy scores and total misconduct, nonaggressive misconduct, and verbally aggressive misconduct with weighted mean effect sizes ranging from .21 to .29; the relation to physical aggression was somewhat weaker, weighted mean effect size of .17, but still statistically significant. Psychopathic offenders are also more likely to recidivate when released from prison. In one of the first meta-analyses, Salekin, Rogers, and Sewell (1996) examined the relation between psychopathy and recidivism; they reported average effect sizes (Cohen's *d*) of 0.55 for general recidivism and 0.79 for violent recidivism. A subsequent meta-analysis (Walters, 2003) reported similar findings with an average weighted effect size (*r*) of .26 for the relation between psychopathy scores and general recidivism.¹

Although a recent meta-analysis (Salekin, 2002) and empirical study (Skeem, Monahan, & Mulvey, 2002) have challenged the belief that psychopathic offenders are untreatable, several reports suggest that psychopathic offenders may be less responsive to treatment than other offenders. In an often cited study, Ogloff, Wong, and Greenwood (1990) reported that psychopathic offenders in a therapeutic community program, compared to nonpsychopathic offenders, remained in treatment for a shorter period of time, expended less effort, and benefited less from treatment they did receive. More recently, Shine and Hobson (2000) examined relations between psychopathy at admission to prison and subsequent behaviors in a therapeutic community program. These authors found that psychopathy scores were significantly negatively related to therapeutic progression. While the perception that psychopathy is untreatable is too strong, there is little evidence to support high optimism (see Harris & Rice, 2006).

Child and Adolescent Psychopathy

The severity and stability of antisocial behavior in psychopathy, and the focus on the assessment of personality inherent in the construct have lead several researchers on child and adolescent antisocial behavior to borrow the construct of psychopathy from the adult literature. These researchers suggest that this construct may help to discriminate those children/adolescents with conduct problems who will become chronic offenders from those whose antisocial behavior will remit over time (Frick et al., 1994; Lynam 1996, 1997).

¹To allow comparison of the effects sizes from Salekin et al. (1996) and Walters (2003), the effect sizes from Salekin et al. can be converted from *d* to *r*. When this is done, the effect sizes are .27 for general recidivism and .37 for violent recidivism.

Towards this end, several instruments have been constructed to assess psychopathic traits in adolescence and childhood (Forth, Kosson, & Hare, 2003; Frick et al., 1994; Lynam, 1997). Each instrument is an attempt to assess the traits comprising adult psychopathy in more developmentally appropriate ways.

Initial validation studies have focused on recreating the nomological network of adult psychopathy in juveniles. With few exceptions, research has supported the idea that child/adolescent psychopathy looks like adult psychopathy (see Lynam & Gudonis, 2005). It bears the expected relations to offending. In a review of the early literature, Edens, Skeem, Cruise, and Cauffman (2001) identified “a robust, moderate association between the various operationalizations of psychopathy and aggressive behavior” (p. 71). Subsequent studies have generally supported this early conclusion. For example, Salekin, Leistico, Neumann, DiCicco, & Duros (2004) found moderate correlations between several indices of child/adolescent psychopathy and number of violent and nonviolent charges. Additionally, several studies have shown that child/adolescent psychopathy provides predictive utility above and beyond other relevant constructs including previous offending, aggression, conduct problems, impulsivity, IQ, and attention problems (see Lynam, 1997). In a recent study, Piatigorsky and Hinshaw (2004), using a personality-based approach to child/adolescent psychopathy, found that this construct was strongly related to concurrent assessments of antisocial behavior and to delinquency 5 to 7 years later even after controlling for concurrent externalizing problems.

Child/adolescent psychopathy has also been found to relate generally, as predicted, to constructs that do not involve offending, such as personality, cognitive processing, and other forms of psychopathology. In each case, the relations replicate those obtained in adults. Child/adolescent and adult psychopathy are related in similar ways to basic dimensions of personality (Lynam et al., 2005; Salekin, Leistico, Trobst, Schrum, & Lochman, 2005). Psychopathic juveniles, like their adult counterparts, show problems in emotional processing (e.g., Blair & Coles, 2000) and deficits in behavioral inhibition (e.g., O’Brien & Frick, 1996). The relations between child/adolescent psychopathy and other forms of psychopathology are somewhat divergent from what is observed for adults, although this may be due to higher rates of comorbidity among childhood disorders (Salekin & Frick, 2004). Lynam (1997) and Salekin et al. (2004) both report that psychopathic juveniles are more prone to externalizing problems than to internalizing problems, but neither study found the negative relations between child/adolescent psychopathy and internalizing problems often observed in adults.

The above studies are important for documenting that child/adolescent and adult psychopathy are assessing similar constructs, but they fail to address a critical question—do psychopathic children and adolescents grow up to be psychopathic adults? A single study has examined the stability of child/adolescent psychopathy over a four-year period in a sample of 100 non-referred children (Frick, Kimonis, Dauchaux, & Farell, 2003). Using the Antisocial Process Screening Device (APSD; Frick & Hare, 2001), these authors found high stability coefficients for parent reports across four years (0.80 for repeated reports by the same parent) and slightly lower stability coefficients for reports from different sources across this same span (an average of .53 for parent-self, teacher-self, and parent-teacher reports). It must be noted that the stability coefficients from this study may be somewhat inflated given that children were selected for inclusion based on their extreme scores on psychopathy. A number of studies have examined the relation between child/adolescent psychopathy and adult offending across various follow-up periods (for a review, see Edens, Campbell, & Weir, in press). In one of the longest follow ups, Gretton, Hare, and Catchpole (2004) found that adolescent psychopathy scores predicted violent recidivism across a ten-year follow-up period. None of these studies, however, assessed psychopathy in adolescence

and adulthood. Thus, it remains unknown how strongly child/adolescent psychopathy relates to adult psychopathy. This question is central to the validity of the child/adolescent psychopathy construct.

The Present Study

As noted by Seagrave and Grisso (2002), “there must be a demonstration that psychopathy as measured in adolescence is predictive of ... psychopathy in adulthood” (p., 233). In the present study, we address this issue directly. Specifically, we examine the relation between psychopathy assessed at age 13 using mother reports on the Childhood Psychopathy Scale (CPS; Lynam, 1997) and psychopathy assessed 10 to 12 years later using interviewer ratings on the Psychopathy Checklist: Screening Version (PCL:SV; Hart, Cox, & Hare, 1995). We also examine another critical, but understudied, issue in child/adolescent psychopathy: incremental predictive utility. Specifically, we examine the relation between adolescent psychopathy and adult psychopathy after controlling for a number of other well-known risk factors for serious adult offending, including race, family structure, family socioeconomic status, neighborhood SES, physical punishment, inconsistent discipline, lax supervision, lack of positive parenting, peer delinquency, behavioral and cognitive impulsivity, verbal IQ, and previous delinquency.

Method

Participants

Participants are members of the middle sample of the Pittsburgh Youth Study. Full details of background characteristics and initial recruitment in 1987–1988 when children (all male) were aged 10 are given elsewhere (Loeber, Farrington, Stouthamer-Loeber, & van Kammen, 1998). Briefly, boys attending the fourth grades in the public school system in inner-city Pittsburgh (about 1,000 in each grade) were randomly selected from schools across the city. Of families contacted, 85% of the boys and their parents agreed to participate. An initial screening assessment identified high risk participants; specifically, about 250 boys (30% of each sample) with the most severe disruptive behavior problems based on caretaker, teacher, and self-reports were identified in each sample. Additionally, an equivalent sized random subset of the remaining 70% of boys was drawn to complete each sample. This selection process resulted in 508 boys for the middle sample, half high risk and half non-high risk. The sample also had approximately equal representations of White and African American boys.

The sample was followed from ages 10 to 13 and again in young adulthood between ages 22 and 26 and assessed on a variety of measures assessing the correlates, causes, and consequences of antisocial behavior. The sample also participated in a substudy, when boys were approximately 12.5 years old, which allowed assessment of psychopathy. Four-hundred and three of the boys provided valid data during this assessment.

Three-hundred and sixteen members of the middle sample were reinterviewed 9 to 13 years (mean = 11.0 years, $SD = .63$) after the last adolescent assessment. Most were interviewed at home, but 4% were interviewed in prisons. Of these 316 participants, 271 had psychopathy data available at age 13 and were eligible for inclusion in the analyses.² Importantly, the men who participated in the present study and those who did not, did not differ significantly on initial risk status at intake ($\chi^2(1) = .15$, ns; $d = .03$), psychopathy at age 13 ($t(401) < 1$, ns; $d = .08$), the Hollingshead two-factor SES index at age 13 ($t(469) = 1.58$, ns;

²For the regression analyses only 226 participants had data on all of the variables. Therefore, analyses were re-run using pairwise deletion; there was no substantial change in the results. Thus, regression results using listwise deletion are reported.

$d = .14$), or seriousness of delinquent involvement at age 13 (chi-square (5) = 1.78, ns; $d = .12$). The men who participated in the follow-up were more likely to be Caucasian (chi-square (1) = 17.73, $p < .001$; $d = .38$); at follow-up, 53% were Caucasian compared to 44% at intake.

Psychopathy

Adolescent psychopathy: Adolescent psychopathy was assessed using the *Childhood Psychopathy Scale* (CPS; Lynam, 1997) when boys were 13 years old. The CPS was developed to operationalize, in childhood and adolescence, the *personality* traits found in the Revised Psychopathy Checklist (PCL; Hare, 2003). Using descriptions of the PCL-R constructs and items previously collected from caregivers, twelve of the 20 PCL-R constructs were operationalized as 2- to 4-item scales: glibness, untruthfulness, manipulation, lack of guilt, poverty of affect, callousness, parasitic lifestyle, behavioral dyscontrol, lack of planning, impulsiveness, unreliability, and failure to accept responsibility. Two PCL-R items, criminal versatility and juvenile delinquency, were not included so that the CPS might serve as a pure measure of personality uncontaminated by antisocial behavior. Additionally, six constructs were not included because they could not be adequately operationalized (boredom susceptibility), did not correlate with other items (grandiosity), or had no childhood counterparts (promiscuous sexual behavior, early behavior problems, many short-term marital relationships, and revocation of conditional release). The operationalization was successful; 8 of the 12 construct scales had alphas above .60 and 10 of the 12 were above .50. The reliability of the total scale was .91.

To validate the CPS, its relation to known correlates of psychopathy was examined (Lynam, 1997). Boys who scored high on the CPS were the most consequential offenders at ages 10 and 13 and the most stable across the two ages. High scorers were also more impulsive on a multimethod, multisource battery of impulsivity measures. They were prone to externalizing disorders, but not internalizing disorders. Finally, scores on the CPS predicted serious delinquency above other known predictors (SES, IQ, previous delinquency, and impulsivity) and alternative parsings of the item pool. Additional studies have shown that the CPS is related to other meaningful constructs including recidivism and poor treatment outcomes in adolescence (Falkenbach, Poythress, & Heide, 2003), the five factor model of personality (Lynam et al., 2005; Salekin et al., 2005), and electrodermal hyporesponsivity (Fung et al., 2005).

Adult psychopathy: Psychopathy in adulthood was assessed with the Psychopathy Checklist: Screening Version (PCL:SV; Hart et al., 1995) which is derived from the Psychopathy Checklist-Revised (PCL-R; Hare, 2003). The PCL:SV was developed with the goal of creating a shorter psychopathy assessment that could be used to assess psychopathy in noncriminal settings and to screen for psychopathy in criminal settings. The PCL:SV is strongly associated with the PCL-R (weighted mean $r = .80$) and is highly similar to the PCL-R in its structure and pattern of relationships to external variables. The PCL:SV consists of 12 items derived from the 20-item PCL-R. There has been much recent discussion regarding the factor structure of PCL:SV and its parent instrument, the PCL-R. For the present paper, we employed the four-factor structure recently proposed by Hare (2003). Three items assess an arrogant, deceitful interpersonal style (facet 1): superficial, grandiose, and deceitful; 3 items assess deficient affective experience (facet 2): lacks remorse, lacks empathy, and does not accept responsibility; 3 items assess an impulsive and irresponsible behavioral style (facet 3): impulsivity, lacks goals, and irresponsible; and 3 assess antisocial behavior (facet 4): poor behavioral controls, adolescent antisocial behavior, and adult antisocial behavior. The 12 items together provide an overall index of

psychopathy. To avoid predictor-criterion overlap, we eliminated the adolescent antisocial behavior item.

Each participant was administered a semi-structured interview, lasting 30 to 45 minutes, derived from the suggested PCL:SV interview. The interview asked about attitudes and behaviors in multiple domains including the interpersonal, occupational, financial, and criminal. Following the interview, each of the 12 PCL:SV items were rated on a 3-point scale (0 = not present, 1 = possibly present, 2 = definitely present). Importantly, interviewers were blind to previous study variables, and had no access to previous reports of psychopathy or offending. Official arrest records were later obtained. Total number of arrests from age 18 to the time of the interview were compared to interviewer ratings of adult antisocial behavior; the correlation was 0.56. A comparison of interview reports of adult arrests and records revealed significant discrepancies for 9% of the respondents. For these individuals, scores on the adult antisocial behavior item were augmented by one as were scores on the item assessing deceitfulness. This procedure is consistent with previous studies of the effects of criminal record data on PCL-R scores (Alterman, Cacciola, & Rutherford, 1993). Because there was no difference in the results for the original and adjusted scores, results using adjusted scores are reported.

Interviewers were college graduates with multiple years of experience in administering study protocols. They completed a full day of training on the PCL:SV conducted by the first author. The training included portions on the general psychopathy construct, interview administration, and PCL:SV scoring. Several cases were reviewed and scored by the group. Individual interviewers also scored cases independently and discussed the scores in the group.

To check the reliability of the ratings, 4% of the interviews (i.e., 10 interviews) were rescored by the first author. Interrater reliability was examined using intraclass correlations based on a single rater and absolute agreement. For individual items, ICCs ranged from .20 for poor behavioral controls to .86 for lacks goals with an average of .61. The reliabilities of the total score and the facets were good; ICCs = .86, .59, .71, .84, and .65 for the total, facet 1, facet 2, facet 3, and facet 4 scales respectively. Coefficient alphas for the scores were also good; α = .89, .72, .83, .91, and .77 for the total, facet 1, facet 2, facet 3, and facet 4 scales. Twenty-seven out of 315 participants (8.6%) met criteria suggested by Hart et al. (1995) for possible psychopathy. Of these 27, 21 (78%) were from the higher-risk status group validating both the ratings and sample selection.

Control Variables at age 13—Additional variables, collected at age 13, were included to examine the incremental predictive utility of adolescent psychopathy. The variables include demographic information, neighborhood SES, parenting, peer delinquency, delinquency, and several other individual difference variables. Each variable has been linked to antisocial behavior in the present data set (e.g., Loeber et al., 2001; Lynam et al., 2000; White et al., 1994).

Demographics: Four demographic variables were included: race (white = 0 vs. non-white = 1), family structure (two-parent = 0 vs. not = 1), family socioeconomic status (SES) and census-defined neighborhood context. The SES of the boy's caretakers was assessed using Hollingshead's two-factor index. If a boy had both a male and female parent or caretaker, the scores were averaged; if he had only one caretaker, that score was used. The neighborhood SES variable was created by factor analysis of nine variables from the 1990 census data (Lynam et al., 2000). The strongest factor accounted for 58% of the variance; the variables loading on this factor were single-parent households, median income, families below the poverty line, families on public assistance, unemployed adults, and percentage

who are African American. Neighborhoods with factor scores in the lowest quartile were classified as high SES, followed by medium-SES neighborhoods, which made up the middle 50%, and those in the upper quartile of factor scores were classified as low-SES neighborhoods. The low-SES group was split once more distinguishing low-SES neighborhoods predominated by public housing from low-SES nonpublic housing areas. These 4 levels were represented by 3 dummy codes with the low SES plus public housing neighborhoods serving as the comparison group.

Family variables: Four family variables were included in the analyses: use of physical punishment, inconsistent discipline, lax supervision, and positive parenting. Physical punishment is a combined caretaker and child construct measuring the extent of physical punishment used by the caretaker. Inconsistent discipline combines 4 caretaker and 5 child questions on persistence in disciplining. Lax supervision, based on boys' and caretakers' reports (4 questions each), reflects parental knowledge of the boys' whereabouts and activities. Low positive parenting is based the frequency of the parent's positive behaviors toward the boy. Seven items represent the construct in both child-report and caretaker-report scales. Each of these scales shows adequate reliability in the present sample (Loeber et al., 2000).

Peer delinquency: Peer delinquency represents the proportion of friends reported by each participant who engaged in each of 11 different forms of delinquency.

Other individual differences: Three measures of other important individual differences were also included in the analyses: behavioral impulsivity, cognitive impulsivity, and verbal IQ. Behavioral and cognitive impulsivity are each taken from a multi-method, multi-source battery of impulsivity measures. These measures included self-, parent-, and teacher-reports, observer ratings, and a variety of performance measures (for details see White et al., 1994). White et al. (1994) identified two factors within these eleven impulsivity variables--behavioral and cognitive impulsivity. Verbal IQ was individually assessed via a short form of Wechsler Intelligence Scale for Children-Revised (WISC-R) (Wechsler, 1974). In this version, all 12 subtests were administered but individual subtests were shortened by administering every other item.

Delinquency: At the age-13 assessment, boys completed the Self-Report Delinquency Instrument used in the National Youth Survey (Elliott, Huizinga, & Ageton, 1985). The instrument inquires about each boy's delinquency during the previous 6 months. The items assess both less serious (e.g., skipping school and stealing something worth less than \$5) and more serious forms of delinquency (e.g., breaking and entering and robbery). Self-report delinquency data were supplemented with teacher and caretaker reports of delinquent behavior. Self-report measures of delinquency have strong psychometric properties, particularly when supplemented by reports from other informants (see Junger-Tas & Marshall, 1999).

Because simple frequency counts of delinquent behavior neglect the relative seriousness of the behaviors and can fail to order persons adequately along a dimension of delinquency, a seriousness classification scheme was developed (Loeber et al., 1998). The severity ratings, adapted from those developed by Wolfgang, Figlio, Tracey, and Singer (1985), place a boy in one of six delinquency levels (0 = no delinquency activity; 5 = multiple serious delinquent acts such as stealing cars, breaking and entering, or selling drugs) based on the most serious act committed in the last six months according to the boy, his teacher, or his caretaker.

Results

Initially, we examined zero-order correlations between the control variables and the psychopathy scales at ages 13 and 24 years. Following these analyses, additional analyses were conducted to examine the specificity of the prediction, the effect of initial psychopathy level and risk status, the degree of “diagnostic” stability, and the incremental predictive utility.

Zero-order relations

Zero-order correlations are presented in Table 1. Age 13 psychopathy scores were moderately positively correlated with total, facet 3, and facet 4 scores eleven years later in young adulthood; $r_s = 0.31, 0.28, \text{ and } 0.33$. Age 13 scores were significantly but weakly correlated with facet 1 and 2 scores eleven years later in young adulthood; $r_s = .19 \text{ and } .15$ for facet 1 and facet 2 scores respectively. As noted in the Table, the correlations observed for facets 3 and 4 were significantly larger than the correlations observed for facets 1 and 2.

Because of the high intercorrelations between the facets at age 24 and the common psychopathy factor underlying them, correlations between residualized scores and age 13 psychopathy were also examined. Specifically, each facet was regressed onto the total psychopathy score and the residuals from these analyses were saved. These residuals represent the unique aspect of each facet that lies outside the common psychopathy factor. The residuals were then correlated with the age 13 psychopathy score. Correlations between residuals for facet 1 and facet 3 with age 13 psychopathy were nonsignificant ($r_s = -.08 \text{ and } .04$ respectively). The correlation with the residual for facet 4 was positive and significant at 0.14 ($p < .05$) indicating significant overlap between age 13 psychopathy scores and adult antisocial behavior not associated with psychopathy. Oddly, the correlation with the residual for facet 2 was significant and negative at -0.14 , $p < .05$; this residual score was negatively correlated with most other residual and raw scores.

Impact of Risk Status and Initial Psychopathy Level

To determine whether the moderate relation between age 13 psychopathy and total psychopathy scores at age 24 differed as a function of initial risk status or psychopathy level, three regressions were run. In the first regression psychopathy at age 24 was regressed onto psychopathy at age 13 after reconstituting a representative sample from the PYS high-risk design by adjusting the weighting of cases. The standardized regression coefficient from this analysis, $\beta = 0.30$, was virtually identical to the zero-order correlation from the unweighted analysis. In the second regression, total psychopathy scores at age 24 were regressed onto age 13 psychopathy and initial risk status (i.e., low-risk versus high risk at ascertainment) at Step 1 and a product representing the interaction of psychopathy and risk at Step 2. At Step 1, psychopathy and risk accounted for 13.6% of the variation in young adult psychopathy, $F(2, 269) = 21.18$, $p < .001$; at Step 2, the product term accounted for no additional variation, $F(1, 268) < 1$, suggesting that the relation between early adolescent and young adult psychopathy was the same across risk status.

A third regression examined whether the relation between early adolescent and young adult psychopathy differed as a function of initial psychopathy level. To do this, psychopathy scores at age 24 were regressed onto age 13 psychopathy scores at Step 1 and the square of these scores at Step 2. At Step 1, psychopathy accounted for 9.6% of the variation in young adult psychopathy, $F(1, 270) = 28.45$, $p < .001$; at Step 2, the squared term accounted for no additional variation, $F(1, 269) < 1$, suggesting that the relation between early adolescent and adult psychopathy was the same across initial levels of psychopathy.

“Diagnostic” Stability

In an effort to assess how stable classification as a psychopath was from age 13 to age 24, we examined the predictive efficiency of age 13 psychopathy. At age 24, participants were divided into those who would receive a possible diagnosis of psychopathy (greater than or equal to 12 after pro-rating) and those who would definitely not be considered psychopathic (Hart et al., 1995). Slightly less than 9% of the sample was identified as possibly psychopathic at age 24. Six different cut-points were employed on the age 13 psychopathy scale: top 30%, 25%, 20%, 15%, 10%, and 5%. For each cut-point, indices of predictive accuracy were computed; these results are provided in Table 2. As can be seen in the table, results are consistent with moderate levels of stability. Specificity (i.e., the conditional probability that an individual was low in psychopathy at age 13 given that he was not psychopathic at age 24) and negative predictive power (i.e., the conditional probability that a participant was not psychopathic at age 24 given that he was not psychopathic at age 13) were both relatively high. For example, at the 20% cut-point, 82% of those who were not psychopathic at age 24, were not psychopathic (i.e., were in the bottom 80%) at age 13. At this same cut-point, 94% of boys who scored low in psychopathy at age 13 (i.e., in the bottom 80%) did not meet criteria at age 24. Specificity increased at more stringent cut-points, but NPP remained high across cut-points. Sensitivity (i.e., the conditional probability that a participant was psychopathic at age 13 given that he was psychopathic at age 24) was lower than specificity at all cut-points and was poor at the highest cut-points. For example, at the 20% cut-point, only 43% of young men who were psychopathic at age 24 scored high in psychopathy at age 13 (i.e., in the top 20%). Positive predictive power (i.e., the conditional probability that an individual was psychopathic at age 24 given that he was psychopathic at age 13) was generally low, but increased with more stringent cut-points.³ Only 16% of boys who scored in the top 20% at age 13 were psychopathic at age 24.

The positive likelihood ratio combines information about sensitivity and specificity to provide the odds that an individual who received a possible diagnosis of psychopathy at age 24 was identified as psychopathic at age 13. These likelihood ratios range from 2.09 to 3.50, generally increasing as the age-13 cut-point became more stringent. At the 20% cut-point, individuals who received possible diagnoses of psychopathy at 24 were 2.39 times more likely to be identified as psychopathic at age 13 than were individuals who did not receive such a diagnosis. Although each of these ratios is above 1, indicating a degree of diagnostic accuracy, they are generally small (Grimes & Schulz, 2005). Finally, the correlation between the two dichotomies, consistent with the moderate correlations for the continuous variables, ranged from 0.12 to 0.21.

Incremental Predictive Utility

To assess the incremental predictive utility of early adolescent psychopathy in predicting young adult psychopathy, a series of regression analyses were conducted. Specifically, each young adult outcome (i.e., total psychopathy and the four facets) was regressed onto psychopathy at age 13 and thirteen additional age-13 constructs related to antisocial behavior: race, family structure, socioeconomic status, neighborhood SES (represented by three dummy coded variables), four parenting variables (use of physical punishment, inconsistent discipline, poor supervision, and positive parenting), peer delinquency, own delinquency, and three individual difference variables (behavioral impulsivity, cognitive impulsivity, and verbal IQ). Table 3 provides results from these analyses. The standardized partial regression coefficients in the table represent the contribution of a variable when all

³These results do not indicate greater stability at lower levels of age 13 psychopathy. Rather, they simply illustrate regression to the mean. Results are similar if one attempts to predict individuals who will receive a score of zero at age 24 using various cut-points at age 13, e.g., bottom 5%, 10%, 15%, 20%, 25%, and 30%.

other variables are in the model; to the extent, that the coefficients for the CPS at age 13 are statistically significant, adolescent psychopathy provides incremental predictive utility in predicting young adult psychopathy. Results were similar across all PCL:SV scales. The 16 variables included in the regression accounted for between 13% and 27% of the variance in the outcome. In each case, CPS scores at 13 bore significant relations to the outcome after controlling for the other variables, although the relation for facet 1 scores was only marginally significant. The CPS was the only consistent predictor of age 24 psychopathy. Family structure was significantly related to 3 of the 5 scales; dummy codes for neighborhood SES were significantly related to only 1 of the 5 scales; inconsistent discipline and behavioral impulsivity were each marginally significantly related to a single scale. In general, although the inclusion of the control variables provided additional predictive power, their inclusion reduced the effect of the CPS scores by only one-third in most cases.⁴ Thus, the predictive relation between age 13 and age 24 psychopathy scores is relatively robust.

Discussion

The study examined the stability of psychopathy from age 13 to age 24 in the middle sample of the PYS. At age 13, psychopathy was assessed using mother-reports on Lynam's (1997) Childhood Psychopathy Scale. In early adulthood, after an average interval of 11 years, psychopathy was assessed by interviewers using the Psychopathy Checklist: Screening Version (Hart et al., 1995). Zero-order correlations revealed moderate stability between the total score on the CPS at age 13 and the total score on the PCL:SV at age 24. The stability was the same across levels of initial risk status and initial psychopathy level. Additionally, scores on the CPS predicted each component of the PCL:SV—facet 1 which assesses an arrogant, deceitful interpersonal style, facet 2 which assesses deficient affective experience, facet 3 which assesses an impulsive and irresponsible behavioral style, and facet 4 which assesses antisocial behavior. It should be noted, however, that scores on the CPS at age 13 were most strongly related to Facets 3 and 4. Importantly, these relations survived controls for 13 different constructs: race, family structure, family SES, neighborhood SES, four measures of parenting, peer delinquency, previous delinquency, and three other individual differences.

In addition to examining relative stability across time, we examined how well psychopathy at age 13 could predict a possible diagnosis of psychopathy at age 24. In terms of diagnostic accuracy across these time points, specificity and negative predictive power were both quite good. Sensitivity was adequate at lower cut-scores, but positive predictive power was generally poor. These results may be expected given the moderate relation between scores across time and the relatively low base rate of psychopathy.

How one interprets the magnitude of the relation between adolescent psychopathy and adult psychopathy will depend on the use to which one wishes to put the construct. On the one hand, a psychopathologist, interested in identifying a potential developmental precursor to a destructive adult syndrome, will likely be encouraged by the present results. Although moderate in absolute terms, the correlation is fairly large when put into context. The lag between assessments is long, over eleven years on average, and the developmental age range spanned is marked by lower levels of trait stability. There is no overlap in the form of assessment (i.e., mother-report vs. interviewer rating), information source (i.e., mother vs. interviewer), or in the behavioral data used to make ratings. Although each assessment is based on the PCL-R, the actual constructs assessed overlap only partially.

⁴The contribution that the control variables make is seen by comparing the R-squared with all variables in the model to the square of the standardized coefficient for the CPS from the bivariate regression shown in parentheses. The percent reduction in the effect of the CPS due to the inclusion of the control variables equals $1 - (\text{partial regression coefficient} / \text{bivariate regression coefficient})$.

Moreover, the correlation between the CPS at age 13 and the PCL:SV at age 24 is similar to what is typically observed when different psychopathy assessments are administered concurrently. Six recent studies (Kosson, Cyterski, Steuerwald, Neumann, & Walker, 2002; Lee, Vincent, Hart, & Corrado, 2003; Murrie & Cornell, 2002; Salekin et al., 2004, 2005; Vitacco, Rogers, & Neumann, 2003) have used either the PCL:YV or PCL:SV along with another psychopathy assessment in juveniles (average age = 15.4). Across studies, the concurrent, cross-source correlations ranged from .35 to .62 with an average of .41. Several additional studies have examined the concurrent relation between the PCL-R and other assessments in samples of adults (Brinkley et al., Kosson, Steuerwald, Forth, & Kirkhart, 1997; Poythress, Edens, & Lilienfeld, 1998). The concurrent cross-method correlations in these studies ranged from .35 to .54. Taking these concurrent cross-method assessments as upper-bounds for the present research, the correlation of .31 is fairly high.

Finally, psychopathologists can note that this level of relative stability is similar to the levels of relative stability observed for basic dimensions of personality. In their meta-analysis on the rank-order consistency of personality, Roberts and Del Vecchio (2000) found the rank-order consistency of personality to be 0.43 across 6.7 years among adolescents (aged 12 to 17.9). Given that stability declines with increasing assessment intervals and divergent assessment methods, the 0.31 rank-order consistency identified in the present study is fairly consistent.

On the other hand, a forensic psychologist, concerned about decision making in a legal context, will be less impressed by the present results. Despite attempts at contextualization, the correlation remains moderate and indicates that psychopathy at age 13 accounts for 10% of the variance in age-24 psychopathy. Forensic psychologists will also be more concerned with the analyses of diagnostic stability. Although specificity and negative predictive power are good and sensitivity is adequate at some cut-points, positive predictive power is poor at all cut-points indicating that most individuals identified as “psychopaths” at age 13 will not receive such a diagnosis at age 24. The positive likelihood ratio is small, ranging between 2 and 3.5. Finally, the present assessment context, with its promise of confidentiality, the existing relationship between participants and study investigators, and the sole reliance on mother-reports at age 13 differs, markedly from the context of a forensic mental health examination (Heilbrun, 2001).

Total scores on the CPS at age 13 were more strongly related to PCL:SV facets 3 and 4 than to facets 1 and 2 at age 24. Similarly, facets 1 and 2 were less well-predicted than facets 3 and 4 in the multiple regressions. The 14 predictors from age 13 accounted for 24 to 27% of the variation in facets 3 and 4, but only 14 to 16% of the variation in facets 1 and 2. There are several possible explanations. First, the CPS and the PCL:SV differ somewhat in their content. Three of the 8 PCL-R items that comprise facets 1 and 2 are not shared across the CPS and PCL:SV; whereas two items from facets 3 and 4 are not shared. Second, elements of facets 1 and 2 may be less stable across time. Certain traits, like grandiosity, glibness, and lack of guilt, may appear later developmentally in response to the behavioral consequences (e.g., alienation of parents, peers, and teachers; arrest) of other earlier appearing traits such as callousness, impulsiveness, and behavioral dyscontrol. Relatedly, the traits assessed by facets 1 and 2, which are more interpersonal in nature and depend more heavily for their assessment on interview behavior, may be more temporally limited. It is worth noting that the present results are consistent with those reported by Skeem and Mulvey (2001) from the MacArthur Risk Assessment Study which also employed the PCL:SV; 11 of the 15 correlations between the PCL:SV factors and validation measures in that study were stronger for Factor 2, which combines facets 3 and 4, than for Factor 1, which combines facets 1 and 2.

As with the stability for the total score, these results are subject to multiple interpretations depending upon one's definition of psychopathy. There is an ongoing debate in the literature regarding how best to define and conceptualize the construct, particularly in regards to the role of antisocial behavior. On one end of the debate, Hare and others (e.g., Hare, 2003; Neumann, Vitacco, Hare, & Wupperman, 2005) have argued that antisocial behavior is a key feature of psychopathy and that psychopathy is a higher-order construct consisting of all four facets. Similarly, from a broad personality perspective, Lynam and colleagues (Lynam & Derefinko, 2006; Lynam & Widiger, in press) have argued that psychopathy consists of extreme scores on a diverse set of basic personality traits and that each PCL-R item, including those present in facet 4, represents an attempt to assess one or more of these traits. From these broad definitions of psychopathy, the moderate relation between age 13 psychopathy and the total score at age 24 is the most relevant one. On the other end of the debate, Skeem and Mulvey (2001) have argued that the traits assessed by Factor 1 which combines facets 1 and 2 be considered primary; from this view, the weaker prediction of facets 1 and 2 is meaningful and suggests that the stability of psychopathy is weak rather than moderate. Somewhere in the middle of this debate, Cooke and Michie (2001) argue that psychopathy consists of the traits present in facets 1, 2, and 3; they exclude items assessing more explicit antisocial behavior (i.e., facet 4) suggesting that these items be considered correlates or consequences of psychopathy rather than core features. From this view, the stability of psychopathy is weak to moderate.

Implications

The implications of the present study are relatively straightforward, particularly in relation to criticisms raised regarding the construct of child/adolescent psychopathy (Edens et al., 2001; Seagrave & Grisso, 2002). Several critics have raised concerns that developmentally normative traits might masquerade as psychopathy and have called for direct assessments of the continuity between child/adolescent and adult psychopathy. The present results directly address this concern and support the argument that adolescent psychopathy, as assessed by the CPS, is a developmental precursor to adult psychopathy, as assessed by the PCL:SV.

Another concern has been with the "added value" of child/adolescent psychopathy. "The field of child and adolescent psychopathology abounds with diagnostic categories and antisocial behavior subtyping schemes. There is no reason to introduce another such scheme unless it provides additional utility" (Lynam, 2002; p. 258). Again, the present results directly address this concern and suggest that adolescent psychopathy is a unique risk factor for adult psychopathy. After controlling for 13 variables assessed at age 13, psychopathy assessed via the CPS continued to predict psychopathy in adulthood.

The critics have also expressed concern about the application of a pejorative label to adolescents given the wide-spread but possibly erroneous belief that psychopathy is untreatable. Although it is possible that the present results may be used to offset the application of a pejorative label, that is not the argument that we make. Rather, we believe that the relative resistance to treatment among adult psychopaths is exactly the reason that the study of child/adolescent psychopathy is to be embraced: The assessment and study of child/adolescent psychopathy holds the key to its treatment. Many researchers simply assume the stability of psychopathy in adulthood. Basic research in personality suggests, however, that stability needs to be explained. With emerging evidence that individual differences in psychopathy are stable across time, research is now needed that explores the reactive, evocative, and proactive person-environment transactions that promote stable individual differences (Caspi, 1998).

Reactive transactions occur when individuals exposed to the same environment experience, interpret, and react to it according to their pre-existing tendencies. Aggressive children make

more hostile attributions in ambiguous situations, generate more aggressive responses, and are more likely to believe that aggressive responses will work. Evocative transactions occur when individuals evoke distinctive reactions from their social environments based on their personalities. Difficult-to-manage children tend to evoke characteristic reactions from parents, including harsh and erratic discipline, reduction of efforts at socialization, and increases in permissiveness. Finally, proactive transactions occur when individuals select or create social environments that are in line with their existing personalities. Individuals tend to choose similar others as friends and mates. In all cases, these person-environment transactions reinforce rather than repudiate the existing personality. In the case of psychopathic behavior, this reinforcement comes, in part, through an accumulation of negative consequences. From this perspective, psychopaths are resistant to treatment due to their accretion of negative consequences (e.g., alienation from family, addiction to drugs, involvement in a criminal peer group, school dropout, injuries, patchy work histories, and multiple incarcerations) that have closed the doors of more legitimate opportunity. From this perspective, treatment will be most effective earlier in the life course, before negative consequences have accumulated and when the opportunity exists to intervene in multiple areas (e.g., school, family, peers, and individually). Psychopathy is stable across time, in part, because we currently fail to recognize its presence early and adequately and fail to intervene effectively.

Limitations

There are limitations to the present study. The most obvious is the high participant loss across the eleven years between assessments. Although there were no differences between those lost and those retained in risk status, SES at age 13, psychopathy at age 13, or seriousness of delinquent involvement at age 13, the groups did differ in the proportion of African Americans. There are sure to be other differences as well. Another limitation is the inclusion of only men in the PYS. Although this exclusion is understandable from a pragmatic standpoint given the focus of the PYS (i.e., the causes and correlates of serious delinquency) and does not influence our estimate of the stability of psychopathy for men, this exclusion precludes comparison of psychopathy across sex—an important area receiving increased interest. Finally, as regards the issue of incremental utility, we controlled for a number of variables but obviously not all of them. Psychopathy in early adolescence uniquely predicts psychopathy in young adulthood even after controlling for race, family structure, SES, neighborhood, poor parenting, bad peers, impulsivity, intelligence, and previous delinquency, but there are other important variables left uncontrolled. For example, Moffitt's (1993) theory posits that risk for chronic offending is highest among individuals with early starting behavior problems and certain types of neuropsychological deficits; neither of these constructs was included in the present study.

Future Directions

Future directions are also clear. The most straightforward involve replication using other developmental periods, samples, and assessments. In the present study, we examined the stability from early adolescence into early adulthood in a high-risk community sample from inner-city Pittsburgh using the CPS and PCL:SV. However, there are other developmental periods that can and should be examined. It will be important to examine the stability of child/adolescent psychopathy in institutional, forensic, and rural settings. There are multiple, reliable and valid means of assessing psychopathy at both the juvenile and adult levels. To the degree that similar stabilities are obtained across differing methodologies the greater will be our confidence in child/adolescent psychopathy as a developmental precursor to adult psychopathy.

Other future directions involve studies with better temporal resolution and finer grained trait-level analyses. It is important to examine stability and change across multiple assessment periods in individual traits. Research suggests that child, adolescent and adult psychopathy can be understood as a diverse collection of personality traits (e.g., Lilienfeld & Andrews, 1995; Lynam et al., 2005; Miller, Lynam, Widiger, & Leukefeld, 2001; Salekin et al., 2005). Given that personality traits may show differential levels of stability across development (McGue, Bacon, & Lykken, 1993) future research should examine the stability of individual elements of psychopathy. These studies should ideally include multiple assessments of these traits across adolescence. Although the present study suggests relative stability of psychopathy from age 13 to age 24, it says nothing about what happens to the levels, particularly the absolute levels, of psychopathy and its constituent elements in between.

For our part, one of the most important directions is an examination of the mechanisms of stability outlined above. The present results suggest that psychopathy is relatively stable from age 13 to age 24. The important next question is why? Future research should seek to understand how psychopathic traits transact with their surroundings to promote their own stability. The specification of these transactions will suggest areas of future intervention.

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Table 1

Zero-order Correlations Among Psychopathy Scores.

	CPS at 13	PCL:SV total	PCL:SV F1	PCL:SV F2	PCL:SV F3
PCL:SV total at 24	0.31 ***				
PCL:SV F1 at 24	0.19 ** a	0.79 ***			
PCL:SV F2 at 24	0.15 * a	0.77 ***	0.66 ***		
PCL:SV F3 at 24	0.28 *** b	0.82 ***	0.51 ***	0.56 ***	
PCL:SV F4 at 24	0.33 *** b	0.86 ***	0.54 ***	0.48 ***	0.61 ***

Note: N equals 271. PCL:SV total and facet 4 scores are computed without the item assessing adolescent antisocial behavior. In the "CPS at 13" column, different subscripts indicate that the correlations are significantly different from one another.

* indicates $p < .05$;

** indicates $p < .01$;

*** indicates $p < .001$.

Table 2

Predicting Possible Psychopathy at Age 24 with Age 13 Psychopathy

Age 13 Psychopathy	Sensitivity	Specificity	PPP	NPP	LR+	phi
Top 30%	0.62	0.73	0.16	0.96	2.30	0.20**
Top 25%	0.48	0.77	0.15	0.95	2.09	0.15*
Top 20%	0.43	0.82	0.16	0.94	2.39	0.16**
Top 15%	0.38	0.88	0.22	0.94	3.17	0.21**
Top 10%	0.29	0.91	0.21	0.94	3.22	0.17**
Top 5%	0.14	0.96	0.29	0.93	3.50	0.12*

PPP = positive predictive power; NPP = negative predictive power; LR+ = likelihood ratio. The likelihood ratio combines sensitivity and specificity and gives the odds that someone identified as psychopathic at age 24, versus not psychopathic, is identified as psychopathic at age 13:

$$LR+ = \frac{sensitivity}{1 - specificity} = \frac{true_positive_rate}{false_positive_rate}$$

Table 3

Incremental Predictive Utility of the CPS at Age 13

	PCL:SV Total Score	PCL:SV Facet 1	PCL:SV Facet 2	PCL:SV Facet 3	PCL:SV Facet 4
Nonwhite	-.01	0.06	0.07	-.03	-.09
Family Structure	0.15*	0.08	0.16*	0.10	0.15*
SES	0.05	0.07	0.03	0.06	0.02
High SES Neighborhood	-.017	-.016	0.07	-.018	-.024*
Mid SES Neighborhood	-.016	-.015	0.05	-.013	-.024*
Low SES Neighborhood	0.00	-.005	0.06	0.06	-.005
Physical Punishment	-.004	0.01	-.010	-.008	0.03
Inconsistent Discipline	0.10	0.13 [†]	0.07	0.10	0.05
Lax Supervision	0.07	0.03	0.09	0.08	0.04
Positive Parenting	-.009	-.007	-.008	-.010	-.004
Peer Delinquency	0.09	0.04	0.12	0.03	0.12
Delinquency	0.00	0.05	-.008	-.009	0.07
Behavioral Impulsivity	0.12	0.08	0.06	0.13	0.13 [†]
Cognitive Impulsivity	0.03	0.10	0.01	0.05	-.003
Verbal IQ	-.009	-.003	-.006	-.012	-.007
CPS total at 13	.21** (.34)	0.13 [†] (0.21)	0.14* (0.20)	0.21** (0.28)	0.20** (0.33)
Total R ²	0.27***	0.16**	0.13*	0.24***	0.27***

Note: N equals 226. Numbers in table represent standardized partial regression coefficients. The number in parentheses for the CPS represents the standardized regression coefficient from a bivariate regression. PCL:SV total and Facet 4 scores are computed without the item assessing adolescent antisocial behavior.

[†] indicates $p < .10$;

* indicates $p < .05$;

** indicates $p < .01$;

*** indicates $p < .001$.