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Structural Coherence and Temporal Stability of Psychopathic Personality Features During Emerging Adulthood

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Abstract

Psychopathy is a complex personality disorder characterized by affective, interpersonal, and behavioral dimensions. Although features of psychopathy have been extended downwardly to earlier developmental periods, there is a discerning lack of studies that have focused on critically important issues such as longitudinal invariance and stability/change in these features across time. The current study examines these issues using a large sample of male adolescent offenders ($N = 1,170$) assessed across 7 annual time points during the transition into emerging adulthood (ages ~ 17 to 24 years). Findings demonstrated that features of psychopathy remained longitudinally invariant across this developmental period, and showed temporally consistent and theoretically coherent associations with other measures of personality, psychopathology, and criminal behaviors. Results also demonstrated that mean levels of psychopathic personality features tended to decrease into emerging adulthood and showed relatively modest rank-order stability across assessments with 7-year lags. These findings suggest that reductions in maladaptive personality features seem to parallel the well-documented decreases in offending that occur during the early 20s.

Keywords

psychopathy; stability; bifactor; invariance

Psychopathy is frequently conceptualized as a constellation of three interrelated facets of personality: affective (i.e., callous-unemotional traits; CU), interpersonal (i.e., grandiose-manipulativeness; GM), and behavioral (i.e., impulsiveness-irresponsibility; II). These features have been researched extensively for adulthood, and studies have increasingly begun to examine early developmental manifestations of psychopathic features in children and adolescents. However, there has been much less focus on potential changes in the developmental manifestations of psychopathic features during the transition from late adolescence into early adulthood, particularly among serious juvenile offenders. Research in this area has a number of important real-world implications, particularly as psychopathy is routinely evaluated as part of juvenile and adult risk assessments (Viljoen, McLachlan, &

Vincent, 2010), with some evidence indicating the term *psychopath* has a sizable impact on jury members, may result in harsher sanctions, and leads to pessimistic views about treatability (Boccaccini, Murrie, Clark, & Cornell, 2008; Viljoen et al., 2010).

The transition into the early 20s, often referred to as emerging adulthood (Arnett, 2000), is an important period for examining developmental change in personality, as a number of pivotal life events often occur during this time (Shanahan, 2000). Indeed, normative changes in personality are considered to be more evident during the transition into emerging adulthood than any other developmental period (Roberts, Walton, & Viechtbauer, 2006). Moreover, extensive research has shown that significant reductions in criminal offending and deviant behaviors occur as adolescents enter their early 20s (e.g., Gottfredson & Hirschi, 1990; Moffitt, 1993). This has led some researchers to suggest that personality dimensions and criminal offending should be examined in a manner that emphasizes their codevelopment (Blonigen, 2010). As psychopathic personality features have consistently been linked to criminal and deviant behaviors, these findings underscore the importance of examining these features during the transition into emerging adulthood.

Several critical issues related to potential changes in the developmental manifestations of psychopathic personality features have not been adequately addressed. First, very little research has examined whether certain behaviors become more or less indicative of psychopathic features from childhood through adolescence (Obradovi , Pardini, Long, & Loeber, 2007; Salekin & Frick, 2005; Seagrave & Grisso, 2002). Second, surprisingly few studies have examined the fundamental assumption that psychopathic features remain fairly immutable in late adolescence and adulthood (Salekin, 2008). Finally, we are aware of no study that has examined whether psychopathic personality features exhibit temporally consistent and theoretically coherent associations with other aspects of personality, psychopathology, and criminal behaviors throughout the transition into emerging adulthood.

Longitudinal Invariance and Features of Psychopathy

When scores on a measure of personality systematically change across time, these differences are considered to arise because of true developmental change. However, as is the case with other personality features, it remains unclear whether certain behaviors become more or less indicative of the psychopathy construct and its core dimensions throughout development (Obradovi et al., 2007; Seagrave & Grisso, 2002). Establishing longitudinal invariance allows researchers to investigate if a construct and the items used to measure that construct consistently assess the same characteristics (e.g., psychopathic features) over repeated measurements (Horn & McArdle, 1992).

The issue of measurement invariance is considered one of the most important areas to address across a number of scientific fields, as a lack of invariance can lead to spurious conclusions (Borsboom, 2006). Surprisingly, very little research has examined this issue in regard to psychopathic features. Additionally, the few studies to have done so have been focused primarily on childhood and adolescence (e.g., Hawes, Pardini, Byrd, & Lynam, submitted, 2013; Obradovi et al., 2007), or on community-based samples and across a limited number of assessments (e.g., Neumann, Wampler, Taylor, Blonigen, & Iacono,

2011). During earlier developmental periods, parent and/or teacher reports are generally used to assess psychopathic characteristics (Dadds, Fraser, Frost, & Hawes, 2005; Viding, Blair, Moffitt, & Plomin, 2005), whereas later periods, such as emerging adulthood, typically rely on self- and interviewer report. As cross-rater agreement is often only modest (Seagrave & Grisso, 2002), and informant effects can influence results (Achenbach, 2011), it becomes all the more important to examine invariance specifically during this later developmental period. Importantly, no study has yet examined this issue with an offending sample throughout the emerging adulthood developmental period.

To establish invariance, it is necessary to first identify the appropriate dimensionality of a construct. A number of prior studies have examined the dimensionality of psychopathic features and have identified a range of best-fitting models, typically consisting of two or more correlated factors (Hare, 2003). More recently, features of psychopathy have been conceptualized in terms of a bifactor model comprised of an overarching psychopathic personality factor and three unique subfactors representing CU traits—GM and II (Patrick, Hicks, Nichol, & Krueger, 2007). This approach reconciles the relatively strong correlation between the three dimensions of psychopathy, and may assist in clarifying the differential relationships often seen among psychopathy factors and theoretically meaningful external correlates. Although previous studies have outlined the potential benefits of applying a bifactor model to the study of psychopathic features (e.g., Patrick et al., 2007), few studies have empirically examined this model in adolescent offenders and none have done so longitudinally.

Stability of Psychopathy Features

Psychopathic features are often conceptualized as a stable personality characteristic (Dadds et al., 2005; Lynam et al., 2005). However, few studies have actually examined the stability of this construct across periods spanning more than a few years in childhood, adolescence, and adulthood (Hare, 2003; Salekin, 2008). Although there is some evidence supporting the position that psychopathic features remain at least moderately stable across development (e.g., Dadds et al., 2005; Loney, Taylor, Butler, & Iacono, 2007; Lynam et al., 2009; Obradović et al., 2007; Viding et al., 2005), these estimates vary according to the length of time between assessments, the specific index of stability employed, and the assessment method used. Additionally, recent large-scale longitudinal studies have demonstrated evidence of significant change in these features over time (Fontaine, McCrory, Boivin, Moffitt, & Viding, 2011; Hawes et al., submitted, 2013; Pardini & Loeber, 2008). However, these studies have largely focused on stability during childhood and adolescence, with limited research examining stability during emerging adulthood, specifically among offending samples.

Convergent and Discriminant Validity

Previous studies have shown that psychopathy can be conceptualized under the rubric of more normative facets of personality (Lynam & Widiger, 2001; Miller, Lynam, Widiger, & Leukefeld, 2001). In general, the overarching construct of psychopathy has most consistently shown a negative relationship with the personality domains of Agreeableness

and Conscientiousness, having less consistent associations with Neuroticism, Openness, and Extraversion (e.g., Miller et al., 2001; Salekin, Debus, & Barker, 2010). Additionally, underlying dimensions of psychopathy are thought to demonstrate differential relationships with these facets of personality (Lynam & Widiger, 2007). Particularly, the CU and GM facets tend to be most robustly related with low Agreeableness, whereas II is most consistently related to low Agreeableness and Conscientiousness and higher Neuroticism (Lynam et al., 2005).

The dimensions of psychopathy have also been associated with internalizing and externalizing problems, as well as with aggression and criminal behaviors (Asscher et al., 2011; Edens, Campbell, & Weir, 2007; Hicks & Patrick, 2006; Yang, Wong, & Coid, 2010). In addition, studies have shown that the underlying dimensions of psychopathy also have distinct relationships with these outcomes. For example, the CU and GM facets of psychopathy tend to be unrelated or slightly negatively related to anxiety and depression (particularly during adulthood), whereas the II is often related to higher levels of internalizing problems (Dadds et al., 2005; Hicks & Patrick, 2006; but see Kimonis, Frick, Cauffman, Goldweber, & Skeem 2012), in particular after accounting for cooperative suppression with behavioral features (see Hicks & Patrick, 2006, for an overview).

Current Study

The current study is designed to address several gaps in the literature related to the assessment of psychopathic features, using a large sample of male adolescent offenders assessed across seven annual assessments (ages ~17 to 24). First, this study will examine if the recently proposed bifactor model of psychopathy provides appropriate fit from late adolescence into the early 20s. Second, longitudinal invariance will be used to determine if features of psychopathy can be measured using similar behavioral indicators throughout this developmental period. Third, the mean-level and rank-order stability of the psychopathy construct during the transitional period of emerging adulthood will be investigated. Lastly, this study will examine whether the features of psychopathy exhibit temporally consistent and theoretically coherent associations with facets of personality, psychopathology, and criminal behaviors across this period.

Method

Design and Participants

This study derives from the Pathways to Desistance project, a multisite prospective study of 1,354 serious adolescent offenders (ages 14 to 17) followed from late adolescence into young adulthood. Because of the low number of females in the Pathways project ($n = 184$), male participants ($n = 1,170$) are the focus of the current study. The participants were from Philadelphia (Philadelphia County), Pennsylvania, and Phoenix (Maricopa County), Arizona. The youth were selected for potential enrollment after a review of the court files in each locale revealed that they had been found guilty of a felony offense (excluding less serious property crimes) or a serious misdemeanor, such as weapons offenses or misdemeanor sexual assault. Because drug violations represent such a large proportion of offenses committed by juvenile offenders, the proportion of juveniles recruited with a drug

offense was capped at 15% of the total sample to maintain significant offender heterogeneity. The proportion of time participants spent in a supervised setting with no community access (e.g., prison, detention, residential or secure treatment) across assessment waves (as calculated by the number of days spent in a supervised setting divided by total number of days in the recall period) ranged from .32 to .51 ($M = .34$, $SD = .29$). Among participants, 44.5% were adjudicated of felony crimes against persons (i.e., murder, robbery, aggravated assault, sex offenses, and kidnapping). Of the 1,170 participants in the current study, 493 (42%) were African American, 225 (19%) were White/non-Hispanic, and 398 (34%) were Hispanic.

Study participants completed a baseline interview followed by interviews every 6 months for the first 3 years of the study, and annually thereafter through 7 years. Retention was very good, averaging 91% across the follow-up period. The current study is primarily focused on data collected during annual follow-up assessments, beginning 1 year after the baseline evaluation through Year 7 of the study. This was done because the self-reported psychopathy measure used in this study was not administered during the initial baseline interview. At the time of the first annual follow-up assessment participants' mean age was 17.55 ($SD = 1.12$), and at the final Year 7 follow-up, the average age was 23.53 ($SD = 1.12$). Therefore, these follow-up assessments are referred to as "Age 17" and "Age 23" throughout the remainder of the manuscript. Descriptive statistics for study measures can be found in Table 1.

Procedures

Participants were first interviewed within 75 days of adjudication in the juvenile system and, for those referred to the adult system, within 90 days of their legal certification as adults. Data were collected with computer-assisted interviews that took place in the participants' homes, in libraries (or other public places), or in facilities. Trained interviewers read each item aloud, and to maximize privacy, respondents could choose to enter their responses on a key pad. All study procedures were approved by the institutional review boards of the participating universities. More information regarding the study rationale, sample, and methodology can be found elsewhere (see Mulvey et al., 2004).

Measures

Demographics—Basic demographic information about each participant was collected from the juveniles, including age and race. Parental occupation and education were coded using a 7-point scale ranging from 1 (*higher executives, proprietors, major professionals; professional degree*) to 7 (*unskilled employees; less than seven years of school*) based on Hollingshead's Index of Social Position (ISP; see Hollingshead, 1957). The mean of the mother and father occupation was taken when data for both parents was available. When occupation data for only one parent was known, parent Index of Social Position was computed using the single parent score. The same rules were followed for education.

Youth Psychopathic Traits Inventory—Short Version (YPI-S; van Baardewijk et al., 2010)—The YPI-S is an 18-item self-report instrument developed from the original 50-item YPI (Andershed, Kerr, Stattin, & Levander, 2002), and designed to assess the core

features of psychopathy in youth. The YPI-S consists of 18 of the original 50 YPI items. The items are designed to index the affective, interpersonal, and behavioral dimensions of psychopathy, here referred to as CU (“To feel guilty and remorseful about things you have done that have hurt other people is a sign of weakness”), GM (“It’s easy for me to manipulate people”), and II (“It often happens that I do things without thinking ahead”), respectively. These three underlying dimensions each consist of six items, and are the same dimensions found in the original measure.

As with the original YPI, each item is scored on a Likert scale, with scores ranging from 1 (*does not apply at all*) to 4 (*applies very well*). Initial studies (Colins, Noom, & Vanderplasschen, 2012; van Baardewijk et al., 2010) have found moderate to good internal consistencies for the YPI-S total (α s = .78 to .85) and factor (α s = .66 to .76) scores, as well as convergent validity with expected outcomes (e.g., conduct problems, self-reported offending) in adolescent offenders (ages ~12 to 19). The YPI-S has not been used in any prior studies using the data collected as part of the Pathways to Desistance project.

The Psychopathy Checklist: Youth Version (PCL:YV; Forth, Kosson, & Hare, 2003)—The PCL:YV is a 20-item measure of psychopathy available for administration with adolescents at least 13 years of age. Each of the 20 items are rated by a trained interviewer on a 3-point scale ranging from 0 (*item does not apply*) to 2 (*item applies*). The PCL:YV was administered during a single assessment, the baseline interview (approximately 1 year prior to the Age 17 assessment). Interrater reliability among raters was evaluated by calculating two-way mixed effects intraclass correlation coefficients (ICCs) using an absolute agreement definition. Reliability estimates for the total (ICC = .92), Factor 1 (ICC = .79), and Factor 2 (ICC = .93) scores were good.

Self-Report of Offending (SRO; Huizinga, Esbensen, & Weiher, 1991)—The SRO is a 24-item measure used to assess involvement in various antisocial and illegal activities. Because two items (“ever went joyriding” and “ever broke into a car to steal”) were not administered to a large number of participants during early assessments, SRO scores are based on 22 items. Two SRO subscales are examined in the current study—a total offending variety score using all 22 SRO items, and an aggressive offending variety score based on a subset of 11 items. Variety scores represent the number of different types of criminal acts in which the person endorsed committing during the recall period.

Wechsler Abbreviated Scale of Intelligence (WASI; Wechsler, 1999)—Estimated overall intelligence was assessed using two subscales from the WASI: Vocabulary and Matrix Reasoning. The two-subtest WASI full-scale IQ score has been found to be highly correlated ($r = .87$) with the full-scale IQ scores from WAIS-III.

The Brief Symptom Inventory (BSI; Derogatis & Melisaratos, 1983)—The BSI is a 53-item self-report inventory, which contains nine subscales designed to assess psychological distress. Participants rate the extent to which they have been bothered (0 = *not at all* to 4 = *extremely*) in the past week by various symptoms. The current study is focused on the anxiety, depression, and anger/hostility subscales.

NEO Personality Inventory-SF (Costa & McCrae, 1992; McCrae & Costa, 2004)

—The NEO-PI-SF is a 120-item short version of the 240-item NEO-PI-R. The NEO family of measures includes widely used personality inventories intended to tap the Big Five dimensions of personality (i.e., Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness). The measure asks participants to rate the degree to which individual statements are true about them using a 5-point Likert scale ranging from 1 (*disagree strongly*) to 5 (*agree strongly*). The NEO-PI-SF was only administered during a single assessment point (Age 18).

The Weinberger Adjustment Inventory (WAI; Weinberger & Schwartz, 1990)—

The WAI is an assessment of an individual's social-emotional adjustment. The current study focused on the eight-item Impulse Control subscale, given it is theoretically consistent with the behavioral features of psychopathy. The measure asks participants to rate how much their behavior in the past 6 months matches a series of statements on a 5-point Likert scale ranging from 1 (*false*) to 5 (*true*). Higher scores indicate more positive behavior (i.e., more impulse control).

Statistical Analysis

First, analyses examined two types of longitudinal invariance— configural and metric. Models were estimated using mean and variance adjusted weighted least squares estimation to account for the ordinal nature of the items using Mplus 7 (Muthén & Muthén, 2012). Configural invariance, which requires the same underlying factor structure adequately fit the measure items at each assessment point, was examined by testing the fit of two competing models across assessments: (a) a correlated three-factor model and (b) a bifactor model. After establishing configural invariance, metric invariance was examined by allowing the loadings and thresholds of the *same* item to be freely estimated across assessments, and contrasting this with a more constrained model in which these loadings and thresholds were held equal (Horn & McArdle, 1992). In both models, the loadings and thresholds of different items were allowed to vary and residual covariances of identical items were estimated. However, to reduce the number of parameters in the model, equality constraints were added to equidistant residual covariances for each item.

The fit of the models were assessed using both absolute and relative fit indices. Absolute fit indices used to examine model fit included the Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI), and the root mean square error of approximation (RMSEA). Cutoff values of .90 or greater were used to indicate acceptable fit, and .95 or greater to indicate good fit, for both CFI and TLI (Hu & Bentler, 1999; McDonald & Ho, 2002). RMSEA values between .05 and .10 were considered to represent an acceptable fit, whereas values less than .05 were considered to indicate good fit (McDonald & Ho, 2002). Relative fit between competing nested models was examined in two ways. First, a correct chi-square difference test for weighted least squares estimation with nested models was calculated using the DIFFTEST procedure in Mplus 7. However, the chi-square difference test has been shown to be sensitive to sample size and violations of normality, which can result in slight discrepancies, leading to model rejection in large samples such as the one used here (Brannick, 1995). As a result, a second method for comparing nested models based on

absolute fit indices in invariance testing was implemented. Specifically, changes in CFI equal to or less than $-.01$, and changes in RMSEA of equal to or less than $.015$, have been proposed as demonstrating evidence metric invariance (Chen, 2007; Cheung & Rensvold, 2002).

Results

Invariance Testing

Comparisons of the correlated three-factor model and bifactor model at each time point indicated that both models provided acceptable levels of fit at each assessment (CFIs = .938 to .976; RMSEAs = .057 to .088). However, the bifactor model provided better fit at each time point according to these indices, with chi-square difference testing also indicating the bifactor model fit significantly better fit at each assessment ($ps < .001$). We next specified a baseline configural invariance model by fitting a bifactor structure to YPI-S items at each time point, but allowing the loadings and thresholds of the items to vary across time. This baseline model provided a good fit to the data ($\chi^2 = 9754.551$, $df = 7,160$, $p < .001$; CFI = .969, TLI = .966, RMSEA = .017). Next, a more parsimonious metric invariance model was specified by constraining the loadings and thresholds of identical items to be equivalent across all assessment waves. Chi-square difference testing revealed that the configural invariance model provided a significantly better fit to the data than the metric invariance model ($\chi^2 = 1246.523$, $df = 750$, $p < .001$). However, examination of absolute fit indices indicated that the metric invariance model still provided a good fit the data ($\chi^2 = 10638.187$, $df = 7,910$, $p < .001$; CFI = .967, TLI = .967, RMSEA = .018), with almost no decrement in model fit relative to the baseline configural model. As the chi-square difference test has been demonstrated to be overly sensitive to model rejection in large samples (discussed in the Statistical Analysis section), and because of the very small change in absolute fit indices between the configural and metric invariance models, these results were considered to support longitudinal invariance of the bifactor model of psychopathy. Factor model comparisons and parameter estimates from the final invariance model are provided as online supplementary materials.

Temporal Stability of Psychopathy Features Across Time

Next, total psychopathy scores and scores for the three underlying dimensions were calculated by summing relevant items. Table 2 provides means, standard deviations, and internal consistencies for these scores. Internal consistencies were relatively high for the total psychopathy score and in the adequate to good range for the CU, GM, and II subscales. An examination of these scores demonstrates a general decrease in the average total psychopathy and dimension scores over time. Dependent-samples t tests were conducted to evaluate whether these mean scores differed significantly from the first to final assessments. These results indicated that the decrease in the mean total psychopathy score from Age 17 to the final Age 23 assessment was statistically significant, $t(1070) = 10.93$, $p < .001$, $d = .34$. This same pattern was seen for the CU, $t(1070) = 7.84$, $p < .001$, $d = .25$, GM, $t(1069) = 8.16$, $p < .001$, $d = .25$, and II, $t(1070) = 9.86$, $p < .001$, $d = .33$ subscales. Although these effects were significant, Cohen's d effect size estimates for these effects were generally small.

Temporal autocorrelations for the total score of psychopathy and the facet scores were investigated as an indication of rank-order stability over time (see Table 3). The correlations were significant and in the moderate to large range across periods spanning 1 year for the total score (.50 to .59), as well as for the CU (.39 to .53), GM (.49 to .58), and II (.48 to .56) facets. The strength of these temporal autocorrelations tended to degrade as the time span between the assessment waves grew longer. For example, correlations between the baseline assessment and final assessment 6 years later were moderate for the total score (.39), and the CU (.35), GM (.39), and II (.34) facets. There was no systematic evidence that the temporal stability of the total or facet psychopathy scores dramatically increased or decreased throughout this developmental period.

Finally, we also identified individuals scoring in the top 10% of total psychopathy scores during the initial assessment (scores ≥ 50), followed by examining the distribution of their scores at the final assessment. A total of 907 participants had scores at each of these assessment waves, and of the 91 found to be in the upper 10th percentile of scores during the initial assessment, only 13 were found to have scores greater than or equal to 50 at the final assessment. Additionally, nine of those 91 individuals had scores falling within the lowest 10th percentile (<26). Figures 1 and 2 includes a visual depiction of the distribution of these scores.

Convergent and Discriminant Validity

Association with PCL:YV—The relationship of the psychopathy total and subscale scores were compared with those from another instrument commonly used to assess aspects of psychopathy (i.e., the PCL:YV). The psychopathy total score was significantly related to the PCL:YV total and factor scores. Each of the underlying dimensions also demonstrated significant associations with the PCL:YV total and factor scores. However, the magnitude of the correlations between the overall psychopathy, CU, GM, and II scores with the PCL:YV total and factor scores were in the low-moderate range, whereas partial correlations of the subscales remained significant but generally low.

Association with normative personality—The general pattern of correlations using the psychopathy total score indicated that higher levels of psychopathy were negatively related to the Agreeableness and Conscientiousness dimensions and positively related to the Neuroticism dimension. An examination of the partial correlations indicated that the CU dimension demonstrated a very small, positive correlation with the Neuroticism scale, and significant negative correlations with each of the other scales. These partial correlations also revealed the GM dimension to be negatively correlated with the Neuroticism and Agreeableness facets, but positively correlated with the Extraversion, Openness, and Conscientiousness facets. Finally, the II subscale demonstrated negative associations with the Agreeableness and Conscientiousness scales and a positive association with the Neuroticism scale, according to these partial correlations.

Association With Internalizing and Externalizing Measures

The total psychopathy score was significantly associated with increased levels of anxiety and depression across assessment waves (see Table 4). Additionally, the total psychopathy

score was positively related to anger/hostility scores, but demonstrated a strong negative relationship with impulse control. An examination of partial correlations revealed that the II dimension demonstrated the same general pattern of results as the overall psychopathy score for each of these internalizing and externalizing scales. These partial correlations also indicated that the CU and GM dimensions demonstrated consistent negative associations with impulse control; however, the magnitude of these associations were smaller than those of the II dimension. Unlike the overall psychopathy construct and the II dimension, the CU and GM subfactors were unrelated to anxiety and depression across assessments once overlap among the subscales was controlled. Although the GM sub-factor was consistently associated with anger/hostility, the CU dimension was unrelated to this scale, according to the partial correlations.

Association With Criminal Behaviors

Finally, the overall psychopathy construct demonstrated a significant positive relationship with total and aggressive offending at each assessment wave. Similarly, the II dimension was significantly associated with total and aggressive offending at each time point, even after controlling for overlap among the underlying dimensions. In contrast, the CU and GM dimensions demonstrated a more inconsistent relationship with these outcomes across time.

Discussion

This represents the first longitudinal investigation to demonstrate that psychopathic features fit a three-bifactor structure among males with a history of serious delinquency from adolescence into young adulthood. Importantly, the findings also demonstrated that the behavioral indicators of psychopathic features remained invariant during this transitional period. This suggests that any changes in psychopathic features observed over this developmental period cannot be attributed to changes in the underlying meaning of the items used to assess these features. Additionally, this provides future studies with evidence that the YPI-S may be considered a suitable measure for longitudinal investigations focused on examining changes in features of psychopathy during the transition into emerging adulthood. There was evidence of change over time in the development of psychopathic features in this study, and these features exhibited temporally consistent and coherent associations with other measures of personality, psychopathology, and self-reported offending behaviors.

Longitudinal Invariance and the Bifactor Model

A bifactor model has been proposed as a way to reconcile differences that are often found among the subfacets of psychopathy by demonstrating that these separate underlying processes may have differential relationships with various outcomes (Patrick et al., 2007). This study demonstrated longitudinal invariance of item functioning when measuring features of psychopathy using self-report during the transition into adulthood among an adjudicated sample of juveniles. The use of invariant measures is exceedingly important for longitudinal studies, as inconsistent behavioral indicators can lead to an inaccurately measured construct and distort conclusions. The results of invariance testing in the current

study increase our confidence that the construct of psychopathic features and its underlying dimensions were assessed consistently across the study period.

Stability and Change

The mean total psychopathy and underlying dimension scores demonstrated a decreasing pattern from late adolescence into the early 20s. Additionally, temporal correlations among these scores at each time point were generally low-moderate to moderate; however, the strength of these associations followed a decreasing pattern as time lags increased. Scholars have increasingly focused on the transitional period from the teenage years to the 20s, often referred to as emerging adulthood, as a period of significant environmental and personal change. Particularly in Western societies, this phase is characterized by increasing autonomy and major life transitions such as beginning to separate from parents, obtaining employment, starting college, and changing peer groups. Although this may account in part for the relatively low stability estimates in the current study, other investigations with community samples have typically found higher test-retest correlations ($\sim .40$ to $.60$) for other self-report measures of personality across periods of 8 to 10 years (Roberts et al., 2006).

The use of a relatively brief measure of psychopathic features in the current study may have contributed to these estimates, but it is possible that the lower levels of stability could be attributed to the focus on serious adolescent offenders. Multiple studies have found that a large portion of adolescents desist from offending during their transition into adulthood (Loeber & Farrington, 2012; Piquero, Hawkins, & Kazemian, 2012). It is possible that this reduced involvement in criminal activity is coupled with a shift in self-concept, particularly as it relates to deviant personality features. In addition, as participants in the current study were a high-risk sample, regression to the mean may have demonstrated some influence in the group decrease in features of psychopathy across time. Although the factors influencing these changes are in need of future investigation, the current study does provide some initial evidence for change in adolescent self-reported ratings of psychopathic features during the transition into young adulthood. Future studies should focus on applying more sophisticated longitudinal models (i.e., growth curves, growth mixture modeling) to better delineate change in psychopathic features across development.

Convergent and Discriminant Validity

Psychopathic features displayed temporally consistent and theoretically coherent associations with a number of external correlates. Within a general framework of personality, psychopathy has been found to be consistently related to low Agreeableness and Conscientiousness (Lynam et al., 2005), a finding that was supported in the current study. Study findings were also generally consistent with prior theoretical and empirical work indicating the CU and GM facets to be negatively related to Agreeableness, and II features linked to low Agreeableness and Conscientiousness, and high Neuroticism (Lynam et al., 2005; Miller et al., 2001). The findings support the view that psychopathy is related to a constellation of general personality facets, and that more detailed information may be gathered when associations are examined using the underlying facets of psychopathy.

Historically, psychopathic individuals have been described as demonstrating low levels of negative emotionality (Hicks & Patrick, 2006). However, similar to previous empirical research, a more complex picture emerged in the current study. Specifically, total psychopathy scores were positively related to aspects of negative emotionality (i.e., anxiety, depression, and anger/hostility), whereas differential associations were found among the underlying dimensions. After controlling for subscale overlap, the II dimension remained positively associated with facets of negative emotionality, whereas the GM facet was related only to anger/hostility. The CU dimension remained unrelated to facets of negative emotionality after controlling for the other subscales. These findings are in line with prior research (Hicks & Patrick, 2006) and increase our understanding of these underlying dimensions.

The psychopathy construct and its core dimensions were significantly associated with total and aggressive offending at multiple time points throughout emerging adulthood. The overarching psychopathy construct and II dimension demonstrated reliable patterns of association with both offending categories, whereas CU and GM were less consistently related. This is consistent with prior research using the YPI and YPI-S (e.g., Colins et al., 2012; Dolan & Rennie, 2006). Although these relationships are not large in magnitude, it is important to recall that the YPI focuses on the interpersonal and affective features of psychopathy, placing less emphasis on behavioral features. These behavioral features have been shown by a large body of research to account for the pre-ponderance of the association between psychopathy and antisocial/criminal-type behaviors.

As shown in other studies, psychopathic features as measured by the YPI-S demonstrated small to moderate correlations with the PCL:YV (e.g., Fink, Tant, Tremba, & Kiehl, 2012; Skeem & Cauffman, 2003). This lack of concordance between measures is particularly pronounced when comparing self-report and interviewer-rated instruments such as the PCL:YV, suggesting the potential presence of significant method and/or rater effects. Although divergent methods for assessing features of psychopathy tend to demonstrate a consistent pattern of associations with theoretically related outcomes, there remains an ongoing debate about the best method for assessing psychopathic features and what should be considered core features of the disorder (see Hare & Neumann, 2010; Skeem & Cooke, 2010).

Strengths, Limitations, and Future Directions

Findings from this study must be considered within the context of several limitations. First, participants were adjudicated male adolescent offenders at study initiation. Issues of longitudinal invariance and stability should be examined in other populations. Similarly, invariance across domains such as race/ethnicity, gender, and socioeconomic status were beyond the scope of the current study and should be examined in future work. In addition, there is debate regarding advantages and disadvantages of using self-report instruments, as well as potential effects associated with method variance (see Lilienfeld & Fowler, 2006; Spector, 2006); current findings should be interpreted with these considerations in mind.

The construct of psychopathy was assessed using a relatively small number of items tapping the underlying interpersonal, affective, and impulsive dimensions. Similarly, some existing

psychopathy measures include items tapping conduct problems and criminal behavior as a separate facet of the construct. Despite these limitations, a bifactor model consisting of a general psychopathy factor and underlying CU, GM, and II dimensions provided good fit and remained longitudinally invariant throughout the study period. Future studies should examine these issues with measures better suited to assess invariance among more overt antisocial behaviors. Similarly, research should examine invariance among alternative measures of psychopathy, and during earlier and later developmental periods.

As longitudinal research becomes increasingly focused on identifying factors that influence developmental change in psychopathic features, researchers must be confident that they are accurately tapping into their intended construct in a similar manner over time. In the current study, a bifactor model of psychopathy demonstrated longitudinal invariance throughout the important transitional period of emerging adulthood. This finding increases confidence that psychopathic features can be adequately indexed using identical behavioral indicators across time. Moreover, the consistent association between psychopathic features and indicators of emotional and behavioral impairment further support the importance of developing effective treatments for youth exhibiting these features.

Although psychopathic features have, at times, been conceptualized as immutable characteristics (see Edens, 2006, for a discussion), growing evidence suggests that changes in these features do occur over time. The relatively modest correlations across periods of several years in this serious juvenile offender sample indicate that although youth exhibiting these features may be at an increased likelihood for presenting with such features during adulthood, they are by no means on an unalterable course leading to adulthood psychopathy. Given the importance placed on the construct of psychopathy across a number of contexts, such as legal decision making and treatment planning, it is important to emphasize that we still know relatively little about what factors predict persistence in these features over time. Study findings emphasize the importance of using longitudinal data to more convincingly demonstrate that neurobiological abnormalities or other factors may lead youth to exhibit persistent psychopathic personality features.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Figure 1. Distribution of total psychopathy scores for upper 10th percentile at initial assessment. Std. Dev. = standard deviation. N = sample size. The color version of this figure appears in the online article only.

Figure 2.

Distribution of total psychopathy scores at final assessment for individuals in upper 10th percentile of initial assessment. Std. Dev. = standard deviation. N = sample size. The color version of this figure appears in the online article only.

Table 1

Descriptive Statistics Across Assessment Waves

	α	Age 17 (n = 1,087)	Age 18 (n = 1,061)	Age 19 (n = 1,056)	Age 20 (n = 1,042)	Age 21 (n = 1,031)	Age 22 (n = 1,004)	Age 23 (n = 962)
Impulsive-irresponsible	.66 to .73	13.66 (3.70)	13.52 (3.71)	13.03 (3.83)	12.90 (3.82)	12.54 (3.89)	12.51 (3.78)	12.41 (3.63)
Depression	.73 to .80	.44 (.65)	.40 (.61)	.39 (.61)	.39 (.60)	.35 (.60)	.41 (.61)	.35 (.60)
Anxiety	.79 to .84	.36 (.54)	.33 (.49)	.29 (.47)	.30 (.46)	.30 (.46)	.32 (.52)	.29 (.51)
Hostility	.69 to .80	.60 (.71)	.53 (.67)	.49 (.68)	.44 (.60)	.44 (.60)	.46 (.63)	.37 (.51)
Impulsivity	.76 to .81	3.19 (.94)	3.04 (.93)	3.22 (.97)	3.25 (.95)	3.24 (.97)	3.30 (.99)	3.33 (.96)
Total offending		1.76 (2.69)	1.47 (2.51)	1.18 (2.26)	1.57 (2.49)	1.43 (2.46)	1.28 (2.14)	1.09 (1.92)
Aggressive offending		.92 (1.39)	.67 (1.21)	.51 (1.07)	.67 (1.19)	.59 (1.14)	.54 (1.03)	.43 (.88)
PCL:YV total ^a	.87	16.13 (7.77)						
PCL:YV Factor 1 ^a	.76	5.08 (3.51)						
PCL:YV Factor 2 ^a	.78	8.44 (3.87)						
Neuroticism ^a	.68	2.36 (.50)						
Extraversion ^a	.74	3.58 (.47)						
Openness ^a	.59	3.05 (.61)						
Agreeableness ^a	.62	3.24 (.50)						
Conscientiousness ^a	.85	3.65 (.46)						
SES ^a		51.65 (12.37)						
WASI ^a		84.48 (12.84)						

Note. Values in columns represent means (SD). PCL = Psychopathy Checklist-Youth Version; SES = socioeconomic status; WASI = Wechsler Abbreviated Scale of Intelligence.

^a Indicates measure was assessed at a single time point (described in Method section). Second column provides the range of internal consistency values for each scale across all time points.

Table 2

Means, Internal Consistencies, and Temporal Correlations for Psychopathy Total and Factor Scores Across Assessments

	<i>M</i> (<i>SD</i>)	α	Age 18	Age 19	Age 20	Age 21	Age 22	Age 23
Total								
Age 17	38.41 (9.12)	.84	.50 (.58)	.44 (.50)	.42 (.49)	.40 (.45)	.37 (.44)	.39 (.44)
Age 18	38.09 (9.41)	.86		.53 (.61)	.46 (.52)	.47 (.54)	.46 (.53)	.44 (.49)
Age 19	36.99 (9.61)	.87			.55 (.63)	.51 (.59)	.52 (.57)	.46 (.51)
Age 20	36.41 (9.19)	.86				.55 (.62)	.53 (.59)	.46 (.52)
Age 21	35.65 (9.70)	.88					.59 (.67)	.49 (.55)
Age 22	35.17 (9.32)	.87						.53 (.60)
Age 23	35.40 (8.71)	.87						
Callous-unemotional								
Age 17	11.59 (3.64)	.72	.38 (.53)	.35 (.48)	.33 (.45)	.29 (.38)	.31 (.42)	.34 (.45)
Age 18	11.47 (3.68)	.76		.46 (.60)	.40 (.54)	.40 (.53)	.39 (.51)	.36 (.47)
Age 19	11.21 (3.71)	.77			.49 (.66)	.47 (.61)	.42 (.54)	.41 (.51)
Age 20	10.90 (3.63)	.76				.49 (.64)	.46 (.60)	.43 (.57)
Age 21	10.67 (3.69)	.79					.52 (.67)	.41 (.52)
Age 22	10.56 (3.68)	.79						.47 (.62)
Age 23	10.76 (3.41)	.78						
Grandiose-manipulative								
Age 17	13.14 (3.94)	.75	.53 (.64)	.46 (.58)	.44 (.54)	.41 (.50)	.39 (.49)	.40 (.48)
Age 18	13.09 (4.09)	.80		.54 (.66)	.45 (.55)	.48 (.58)	.44 (.55)	.44 (.53)
Age 19	12.75 (4.06)	.79			.55 (.68)	.50 (.61)	.50 (.61)	.44 (.55)
Age 20	12.60 (3.83)	.77				.54 (.66)	.52 (.63)	.47 (.55)
Age 21	12.43 (4.05)	.80					.59 (.71)	.49 (.60)
Age 22	12.08 (3.93)	.79						.49 (.61)
Age 23	12.22 (3.75)	.80						
Impulsive-irresponsible								
Age 17	13.66 (3.70)	.67	.47 (.64)	.37 (.48)	.40 (.56)	.38 (.51)	.36 (.49)	.34 (.45)
Age 18	13.52 (3.71)	.69		.48 (.64)	.43 (.57)	.42 (.56)	.42 (.55)	.39 (.51)
Age 19	13.03 (3.83)	.72			.47 (.63)	.45 (.61)	.49 (.65)	.43 (.56)

	<i>M (SD)</i>	α	Age 18	Age 19	Age 20	Age 21	Age 22	Age 23
Age 20	12.90 (3.82)	.71				.49 (.64)	.47 (.63)	.41 (.56)
Age 21	12.54 (3.89)	.73					.56 (.74)	.48 (.63)
Age 22	12.51 (3.78)	.72						.55 (.73)
Age 23	12.41 (3.63)	.73						

Note. All correlations significant at $p < .001$. Parentheses include correlations when variables were specified as latent constructs rather than observed scores.

Table 3

Bivariate and Partial Correlations Between Psychopathy Total and Factor Scores and External Criteria at Single Assessment

	PCL:YV Total	PCL:YV F1	PCL:YV F2	NEO: N	NEO: E	NEO: O	NEO: A	NEO: C
Psychopathy Total	.25	.19	.22	.29	.01 ^a	-.03 ^a	-.48	-.26
Callous-Unemotional	.13 (-.02 ^a)	.08 (-.04 ^a)	.13 (-.01 ^a)	.24 (.09)	-.12 (-.21)	-.11 (-.14)	-.38 (-.14)	-.23 (-.11)
Grandiose-Manipulative	.23 (.14)	.21 (.17)	.18 (.08)	.13 (-.09)	.11 (.18)	.07 (.15)	-.40 (-.20)	-.06 ^a (.18)
Impulsive-Irresponsible	.23 (.13)	.15 (.07)	.23 (.16)	.36 (.30)	.02 ^a (.04 ^a)	-.06 ^a (-.05 ^a)	-.40 (-.20)	-.37 (-.33)

Note. Correlations significant at $p < .05$ unless otherwise indicated. Parentheses include partial correlations after controlling for other two YPI-S dimensions. PCL:YV scores assessed during baseline interview are correlated with psychopathy scores from the Age 17 assessment. NEO scores assessed during the Age 18 assessment are correlated with psychopathy scores from Age 18 assessment. PCL:YV = Psychopathy Checklist–Youth Version; F1 = Factor 1; F2 = Factor 2; NEO: N = neuroticism; NEO: E = extraversion; NEO: O = openness; NEO: A = agreeableness; NEO: C = conscientiousness.

^a Nonsignificant.

Table 4

Bivariate and Partial Correlations Between Psychopathy Total and Factor Scores and External Criteria at Each Assessment Wave

	Age 17	Age 18	Age 19	Age 20	Age 21	Age 22	Age 23	Range
Depression								
Psychopathy total	.20	.18	.12	.12	.12	.15	.08	.08 to .20
Callous-unemotional	.08 (–.05 ^a)	.07 ^a (–.08)	.04 ^a (–.06 ^{ab})	.04 ^a (–.05 ^a)	.00 ^a (–.13)	.04 ^a (–.09)	–.03 ^a (–.14)	–.03 to .08 (–.14 to –.05)
Grandiose-manipulative	.13 (.03 ^a)	.13 (.04 ^a)	.08 (.02 ^a)	.04 ^a (–.05 ^a)	.11 (.07 ^a)	.08 (.02 ^a)	.06 ^a (.02 ^a)	.04 to .13 (–.05 to .07)
Impulsive-irresponsible	.24 (.21)	.24 (.22)	.17 (.16)	.20 (.21)	.18 (.18)	.23 (.23)	.17 (.20)	.17 to .24 (.16 to .22)
Anxiety								
Psychopathy total	.19	.16	.23	.15	.09	.21	.12	.09 to .23
Callous-unemotional	.08 (–.05 ^a)	.05 ^{ab} (–.09)	.14 (–.02 ^a)	.11 (.03 ^a)	.01 ^a (–.09)	.11 (–.04 ^a)	.00 ^a (–.13)	.00 to .14 (–.02 to –.13)
Grandiose-manipulative	.14 (.05 ^a)	.10 (.02 ^a)	.17 (.05 ^a)	.06 ^a (–.04 ^a)	.04 ^a (–.02 ^a)	.17 (.08)	.06 ^a (.00 ^a)	.04 to .17 (–.04 to .08)
Impulsive-irresponsible	.22 (.18)	.23 (.23)	.25 (.19)	.18 (.15)	.16 (.19)	.22 (.17)	.21 (.24)	.16 to .25 (.15 to .24)
Hostility								
Psychopathy total	.28	.30	.30	.29	.28	.32	.23	.23 to .32
Callous-unemotional	.13 (.03 ^a)	.17 (–.04 ^a)	.19 (–.06 ^a)	.16 (.08)	.15 (.01 ^a)	.19 (.07 ^a)	.11 (–.03 ^a)	.11 to .19 (–.06 to .08)
Grandiose-manipulative	.23 (.11)	.26 (.13)	.23 (.09)	.22 (.07 ^a)	.27 (.05 ^a)	.29 (.05 ^a)	.18 (.09)	.18 to .29 (.05 to .13)
Impulsive-irresponsible	.30 (.21)	.27 (.16)	.30 (.20)	.30 (.13)	.24 (.18)	.28 (.15)	.25 (.17)	.24 to .30 (.13 to .21)
Impulse control								
Psychopathy total	–.51	–.42	–.48	–.55	–.52	–.53	–.53	–.55 to –.42
Callous-unemotional	–.33 (–.06 ^a)	–.27 (.00 ^a)	–.33 (–.03 ^a)	–.40 (–.12)	–.35 (–.02 ^a)	–.39 (–.10)	–.35 (–.01 ^a)	–.40 to –.27 (–.12 to .00)
Grandiose-manipulative	–.35 (–.08)	–.26 (–.01 ^a)	–.30 (.00 ^a)	–.34 (–.02 ^a)	–.33 (–.01 ^a)	–.31 (.00 ^a)	–.31 (–.04 ^a)	–.35 to –.26 (–.08 to .00)
Impulsive-irresponsible	–.56 (–.44)	–.52 (–.44)	–.57 (–.48)	–.61 (–.49)	–.61 (–.51)	–.61 (–.51)	–.63 (–.54)	–.63 to –.52 (–.54 to –.44)
Total offending								
Psychopathy total	.31	.28	.27	.27	.28	.30	.26	.26 to .31
Callous-unemotional	.26 (.13)	.22 (.07)	.18 (.00 ^a)	.20 (.05 ^a)	.21 (.03 ^a)	.19 (.00 ^a)	.20 (.06)	.18 to .26 (.00 to .13)
Grandiose-manipulative	.20 (.02 ^a)	.19 (.03 ^a)	.22 (.08)	.22 (.10)	.21 (.05 ^a)	.26 (.14)	.20 (.09)	.19 to .26 (.02 to .14)
Impulsive-irresponsible	.30 (.19)	.29 (.20)	.29 (.20)	.24 (.13)	.30 (.20)	.29 (.19)	.23 (.12)	.23 to .30 (.12 to .20)
Aggressive offending								
Psychopathy total	.30	.26	.21	.23	.27	.25	.19	.19 to .30

	Age 17	Age 18	Age 19	Age 20	Age 21	Age 22	Age 23	Range
Callous-unemotional	.24 (.09)	.20 (.05 ^a)	.13 (.02 ^a)	.17 (.07)	.20 (.04 ^a)	.17 (.03 ^a)	.16 (.06 ^a)	.13 to .24 (.02 to .09)
Grandiose-manipulative	.19 (.04 ^a)	.17 (.04 ^a)	.15 (.04 ^a)	.19 (–.02 ^a)	.19 (.04 ^a)	.21 (.04 ^a)	.13 (.03 ^a)	.13 to .21 (–.02 to .04)
Impulsive-irresponsible	.30 (.15)	.26 (.17)	.23 (.18)	.20 (.13)	.28 (.16)	.24 (.16)	.16 (.12)	.16 to .30(.13/.18)

Note. Correlations significant at $p < .05$ unless otherwise indicated. Parentheses include partial correlations after controlling for the other two factors.

^aNonsignificant.