Dimensions of Psychopathic Traits in a Community Sample: Implications from Different Measures for Impulsivity and Delinquency

Running HEAD: Psychopathy Dimensions in Young Adults

Abstract

There are valid measures of psychopathic traits in youth, such as the Youth Psychopathic Traits Inventory (YPI). However, it is unclear how another self-report measure, which is based on a different conceptualization of psychopathy relates to the YPI in youth and to antisocial behavior. We therefore, compared the construct validity of two measures: the personality-based Psychopathic Personality Inventory-Revised (PPI-R) and the YPI – based on adult antisocial personality traits. First, both measures showed sufficient model fit and some overlap in their variance, particularly YPI impulsive irresponsible and grandiose manipulative factors with PPI-R self-centered impulsivity, as well as YPI callous-unemotional with PPI-R coldheartedness. We found that although overall delinquency was correlated with PPI-R and YPI subscales, only the Self-centered Impulsivity factor of the PPI-R and only the Impulsive/Irresponsibility domain of the YPI were statistically predictive of self-reported antisocial behavior. Thus, the PPI-R and the YPI both show moderate construct validity and criterion validity for use among young community adults.

Keywords: young adults, psychopathic traits, self-report, delinquency

**Introduction**

The validity of assessing psychopathy in young people has been the subject of research attention. The aim has been to identify these traits in young people at early stages to aid prevention and intervention specifically for criminal behavior. Much of this research is based on self-report. Yet, although research has shown these measures are valid, the comparisons between measures with different theoretical bases have been less often investigated in youths. We compare a well-validated measure of youth psychopathic traits with another measure that was developed for adults.

**Valid measures of psychopathy in young adults**

The Youth Psychopathic Traits Inventory (YPI;Andershed, Kerr, Stattin, & Levander, 2002) was designed for youths between the ages of 12 and 18 years and was modeled based on the adult conceptualization of the Psychopathy Checklist Revised (PCL-R; Hare, 2003), to reflect ten core personality traits that are relevant for psychopathy: grandiosity, lying, manipulation, callousness, unemotionality, impulsivity, irresponsibility, dishonest charm, remorselessness, and thrill-seeking. Thus, three subscales are *behavioral* – impulsivity, irresponsibility, and thrill-seeking – and so are likely to be related to criminal *behavior*. Consistently, the YPI total score as well as the different factors have been shown to be a valid predictor of problem behaviors for youths and young adults (e.g. Poythress, Dembo, Wareham, & Greenbaum, 2006).

**Relations between YPI and PPI-R**

There is another inventory that has been created to examine psychopathic traits in adults, and varies in the way that it focuses on personality traits that are separate from purely behavioral features. The Psychopathic Personality Inventory Revised (PPI-R; Lilienfeld & Widows, 2005) has item content that taps varied affective and interpersonal personality traits (like the YPI’s callous-unemotional and grandiosity-manipulativeness subscales), and also includes behavioral items measuring impulsivity. Although this measure was developed mainly for adult populations, its personality-based approach may be arguably relevant for young individuals as it uses a wide range of temperamental or personality concepts; thus, it may get at personality traits earlier in development facilitating intervention strategies if antisocial behavior has not yet manifested. On the other hand, young individuals could fail to engage with descriptions of themselves when asked about abstract personality traits, such that these require good introspection. The validity of the PPI-R in young adults is unknown and has not been compared to the more widely used (in youths) YPI. There is at least one study, which compared the two inventories. In an adult community sample (mean age 35 years), the PPI-R and the YPI have been shown to be moderately correlated (*r* = .70 – .20 for the subscales) (Uzieblo, Verschuere, Van den Bussche, & Crombez, 2010), suggesting there may be good criterion-related validity for the PPI-R across a wide age range.

Theories about the factor structure of psychopathy and the related measures also differ: (1) psychopathy is either conceptualized as a personality-based disorder where antisocial behavior is a byproduct, e.g. PPI-R; or (2) antisocial behavior is conceptualized as part and parcel of psychopathy, e.g. the YPI (see e.g. Brazil, van Dongen, Maes, Mars, & Baskin-Sommers, in press; Lilienfeld, Watts, Francis Smith, Berg, & Latzman, 2015). These differences contribute to the content of the respective items and to the structure of the measures that have been created. A recent study showed that adolescents’ sensation seeking trait measurement varied based on how items were conceptualized from a theoretical perspective (Altmann, Liebe, Schönefeld, & Roth, 2017). Thus, variance in responses to psychopathy questionnaires may be based on different theoretical bases for the construction of item content.

**Construct validity of the YPI and PPI-R**

Within a variety of samples, validation studies of self-reported psychopathy, such as the PPI-R and the YPI, rely on their statistical prediction of delinquency (i.e., criminal behavior in young people). This is regardless of the relevance of delinquency for juveniles and adolescents for validating the construct of psychopathy (Fox, Jennings, & Farrington, 2015; see e.g. Salekin & Frick, 2005; Salihovic, Kerr, & Stattin, 2014). In a general population sample of youths (mean age 16.4 years), the PPI-R total score was moderately correlated with self-reported proactive (*r* = .59) and reactive aggression (*r* = .40) (Taubner, White, Zimmermann, Fonagy, & Nolte, 2013). Relatedly, in a specialized sample of children (ages 17-19 years) in foster care, PPI-R scores were related to more diverse forms of criminal behavior and subsequent involvement with the criminal justice system (Vaughn, Litschge, Delisi, & Beaver, 2008). Furthermore, DeLisi et al. (2013) found that the PPI sum score can differentiate youths high on career delinquency, defined as a compendium of antisocial behavior, substance abuse and criminal justice system involvement from those low on career delinquency, with most predictive value from the subscales of Blame Externalization, Fearlessness and Carefree Nonplanfulness. Although variance explained was low at 21%, these subscales relate to disinhibitory and impulsive traits, and so are unsurprisingly related to antisocial behavior. Regarding the YPI, a significant but moderate correlation (*r* = .35) between the YPI total score and self-reported delinquency was found in a general population of adolescents (Chabrol, Leeuwen, Rodgers, & Séjourné, 2009) as well as a small but significant correlation between criminal offenses and the YPI callous-unemotional factor (*r* = .18) as well as the impulsive-irresponsible factor (r = .24; Neumann & Pardini, 2014). For a female sample, the affective factor of the YPI has been found predictive of self-reported criminal and violent behavior (Chauhan et al., 2012). Thus far, the construct validity of both the PPI-R and the YPI has not been investigated in youths. The PPI-R, although designed for adult samples was suggested to be used in youth as well, but there are only few investigations on criterion-related validity regarding delinquency. In addition, it may be that some additive combination of the two inventories could be better at predicting delinquency than any single inventory.

**Relating psychopathic traits to delinquency in juveniles**

In this study, we aimed to compare responses to two different self-report measures of psychopathic traits: the PPI-R and the YPI in a community sample of young adults. To test the overlap and discrepancies, we compare the measures and their factors descriptively and for model fit. To investigate the validity of the two measures, we test the strength of the relations between the YPI and self-reported delinquency as possibly being different from the strength of the relation between the PPI-R and self-reported delinquency. Finally, we examine the predictive ability of both measures in a single statistical model.

**Method**

**Participants**

The sample consisted of 339 students at a vocational training school (79f, 260m). After excluding participants who showed inconsistent responding in the PPI-R (IR < 30, IRA < 60; Lilienfeld & Widows, 2005), we used data from 270 participants (69f, 201m; age: *M* = 19.02, *SD* = 2.51, range: 15-34). Participants were recruited and gave consent at a vocational training school after informed consent was obtained from their parents. Female and male participants differed in all categories of self-reported delinquency as well as on all YPI and PPI-R factors (see Table 1). For 88.8% German was the mother-tongue, the remaining sample described their language skills as sufficient. The majority of the sample (93.7%) received at least 9 years of school education prior to the vocational training school. Most of the participants report to have siblings (*n* = 264, 86%) and about half of them reported to live with their parents (*n* = 183, 60%), while 35 participants reported to live on their own (12%) and 72 participants reported to live with either father or mother (24%).

**Measures**

**Youth Psychopathy Inventory (YPI).** The YPI is a 50-item self-report instrument for adolescents, developed for non-referred youth to measure the three personality dimensions of psychopathy: a Grandiose- Manipulative (subscales: Dishonest Charm, Grandiosity, Lying, and Manipulation), a Callous-Unemotional (Callousness, Unemotional, and Remorselessness), and an Impulsive-Irresponsible Dimension (Andershed, Kerr, Stattin, et al., 2002). Items are answered on a 4-point scale (1 = does not apply at all, 4 = applies very well). The YPI has been validated in different samples, showing positive relations with self-reported conduct problems (Andershed, Kerr, & Stattin, 2002; Declercq, Markey, Vandist, & Verhaeghe, 2009; Hillege, Das, & de Ruiter, 2010; Neumann, Kosson, Forth, & Hare, 2006). In young adult offenders the YPI has shown predictable relations with internalizing and externalizing psychopathology and criminal offenses (Neumann & Pardini, 2014). The internal consistency (Cronbach’s alpha) of the interpersonal dimension ranged from *rα* = .90 to .91, from *rα* = .57 to .77 for the affective dimension, and from *rα* = .82 to .83 for the behavioral dimension (Sherman, Lynam, & Heyde, 2014). The German version has demonstrated high internal consistency as well as convergent validity (Heinzen, Köhler, & Hinrichs, 2008). Reliabilities in this current sample ranged from *rα* = .92 for the Grandiose-Manipulative factor to .82 for the Impulsive-Irresponsible factor (see Table 1).

**Psychopathic Personality Inventory Revised (PPI-R).** This self-report questionnaire (Lilienfeld & Widows, 2005) has been developed in student samples to assess psychopathic traits as conceptualized by Cleckley. The 154 items, answered on a 4-point Likert scale, can be assigned to eight subscales and three validity scales designed to detect aberrant responding. The content subscales are Blame Externalization, Rebellious Nonconformity, Coldheartedness, Social Influence, Carefree Nonplanfulness, Fearlessness, Machiavellian Egocentricity, and Stress Immunity. These factor-analysis-derived subscales can be assigned to two factors: Fearless Dominance (FD) and Self-Centered Impulsivity (SCI), also called Impulsive Antisociality (Lilienfeld & Widows, 2005), a structure that does not include the subscale Coldheartedness (CO) but has been replicated across samples (Benning, Patrick, Hicks, Blonigen, & Krueger, 2003; Ross, Benning, Patrick, Thompson, & Thurston, in press). The German version (Alpers & Eisenbarth, 2008) has demonstrated good internal consistency of *rα* = .85 for the total score in students and detained samples (Eisenbarth & Alpers, 2015). Reliabilities in the current sample ranged between *rα* = .90 to .85 (see Table 1). As a measure of validity of the responses, the PPI-R includes a measure of inconsistent responding. We excluded 69 participants from analyses based on the suggested cut-off for inconsistent responding (IR < 30, IRA < 60; Lilienfeld & Widows, 2005).

**Delinquency.** We measured delinquency asking participants how often in their life they committed different delinquent acts, based on a German un-published measure for non-legal behavior (Fragebogen zur Legalbewaehrung; Lewand, 2003). Behaviors that we asked for belonged to four different categories: violent crimes (threat of violence, actual violence and threat involving a gun), burglary crimes (burglary, car or bike theft, leaving restaurant without paying), drug use crimes (use of different type of drugs) and property damage crimes (damage of private or public property, arson). Each item was answered on a scale ranging from “never” (scored as 0) and “not within the last 12 months” (scored as 2) to “more than 10 times” (scored as 3). Sum scores were computed across all items. For the summary variables, means were calculated for each of the four categories.

**Statistical Analyses**

A confirmatory factor analysis (CFA) was conducted using Mplus 7.3 (Muthen & Muthen, 2010) using maximum-likelihood, which is robust to missing data. Covariance coverage of the data ranged from .89 to 1.00, which is higher than the recommended .10. To examine whether the model fit explained the data well, we used chi-square: a non-significant chi-square indicates good fit. Yet, chi-square with sample sizes as large as that used in the present study (n=109) is often significant with even trivial deviations from a perfect model. Hence, we used three indices of practical fit as suggested by prior research (CFI, Bentler, 1990; RMSEA, Browne & Cudeck, 1993; TLI Tucker & Lewis, 1973). A comparative fit index (CFI) and TLI> .90 suggests an acceptable model fit (Bentler & Bonett, 1980) and > .95 suggests a good model fit. A root mean square error of approximation (RMSEA) < .08, suggests an acceptable fit; an RMSEA < .06 suggests a good fit (Browne & Cudeck, 1993).

Negative binomial regression analyses were conducted since the data represented frequency counts based on the frequency categories of delinquent activity. The data included a moderate to high proportion of zeros (ranging from .32 to .58 across property crime, violence, and drug use) reflecting a generally low frequency for most items, as would be expected for this cohort. Thus, zero-inflated negative binomial regression was selected for analysis using Mplus 7.3, because this statistic corrects for severely positively skewed (towards zero) data that are over-dispersed (Browne & Cudeck, 1993). The zero-inflated regression analysis generates both a count variable, indicating the *variety* of delinquency, and a binary latent variable, indicating whether participants endorsed *any* delinquent activity at any time. Two coefficients were produced by Mplus for each of the three dependent variables; for example, one coefficient to be predicted was the count variable for crime and a binary inflation latent variable – the likelihood of a participant assuming *any value except* *zero* (Muthen & Muthen, 2010), an approach similar to other binary regression techniques but *beta values are opposite in sign to logistic regression*. These analyses provided information about whether psychopathy predicted greater delinquency. Yet, at the same time the analyses provided information about whether psychopathy predicted engagement at all in delinquency.

To examine construct validity of the PPI-R and YPI in this sample, the first step of a regression regressed the dependent variables (the three delinquency measures) onto age and sex, in order to control for their variance. Differences in model fit (Log-Likelihood) after the psychopathy scales were entered as predictors were taken as significance of psychopathy in predicting delinquency domains. Separate models examined the PPI-R and the YPI. Since scaled Log-Likelihood estimates (using Maximum Likelihood with Robust standard errors) were employed, Satorra-Bentler correction (Muthen & Muthen, 2010) was consistently applied to adjust for non-normality. The effect size of variance explained in delinquent behavior between the models was informed by the proportion of residual variance (i.e., dispersion) change between models. To interpret effect sizes associated with psychopathy, we included confidence intervals of the unstandardized estimates (i.e., betas). See the Electronic supplemental Material for the data set (YouthPPI\_YPI\_EJPA\_data.sav) and the output files.

**Results**

**Model fit and criterion validity of the PPI-R within a young adult sample**

We examined how well the seven subscales of the PPI-R and the 10 subscales of the YPI were represented by the latent factors identified in prior research. That is, without Coldheartedness, which is separated in prior research, we examined the factor loadings of the seven subscales onto their respective factors of Self-centered Impulsivity and Fearless Dominance. Included in the same confirmatory factor analysis (CFA), we included the three latent factors of Grandiose/Manipulative, Callous/Unemotional, and Impulsive/Irresponsible representing the 10 subscales of the YPI. Including the YPI and PPI-R latent factors in the same CFA allowed for identification of the underlying factors, since some factors have only three indicators. If three indicators would be used, for example, the loadings must be strong across all three, otherwise identification may be poor; a three-indicator factor may behave as if it only had two indicators if one item shows a weak loading. Furthermore, including all factors of both measure into one model does not reduce correlations between factors due to unreliability of the scales. Also, this allows us to investigate shared factor loadings between the two inventories (e.g., the YPI Impulsive/Irresponsible subscale might show an affinity toward loading on the PPI-R Self-centered Impulsivity factor). Chi-square as a measure of model fit was significant, and the indices of practical fit suggested that the model tested was of inadequate fit, *χ2*(109) = 604.60, *p* < .001; *TLI* = .71, *CFI* = .77, *RMSEA* = .124, 90% CI=.115, .134. In Table 2, one can see that the average standard errors for each factor are different. Of note, the Fearless Dominance factor had average standard errors (.07) twice the average of the factor with the lowest standard errors (YPI-II at .03). We investigated the fit for the two inventories separately to unpack the poor fit of the model and the results are beyond the scope of our aims. In brief, the YPI showed good fit, *χ2*(32) = 105.232, *p* < .001; *TLI* = .92, *CFI* = .94, *RMSEA* = .086, 90% CI=.068, .104, but the fit for the PPI was poor, *χ2*(15) = 217.739, *p* < .001; *TLI* = .33, *CFI* = .53, *RMSEA* = .208, 90% CI=.184, .233. This model was specified with some specifications for Fearless Dominance: the estimate of the factor loading and variance for PPI Stress immunity was set to 1.0 and we equated the factor loadings of the other two indicators. The modification indices show that the residual variance of Rebellious nonconformity is associated with the residual variance of indicators of Fearless Dominance. Specifying these in a revised model resulted in an improved fit but far from adequate, *χ2*(13) = 121.718, *p* < .001; *TLI* = .59, *CFI* = .75, *RMSEA* = .164, 90% CI=.138, .191.

The completely standardized factor loadings are shown in Table 2. None of the standardized factor loadings was under .30, indicating that generally there were moderate to strong relations between indicators and their respective latent factors. The factor correlation was strong between PPI-R Self-centered Impulsivity and YPI Impulsive/Irresponsibility as would be expected (*r* = .99), but was also moderately correlated with YPI Callous/Unemotional (*r* = .61). YPI Grandiose/Manipulative was most highly correlated with PPI-R Self-centered Impulsivity (*r* = .77) and YPI Impulsive/Irresponsibility (*r* = .71), but was also correlated with YPI Callous/Unemotional (*r* = .62). PPI-R Fearless Dominance showed the weakest correlations; it was weakly to moderately correlated with YPI Grandiose/Manipulative (*r* = .48), YPI Callous/Unemotional (*r* = .50), YPI Impulsive/Irresponsibility (*r* = .31), and PPI-R Self-centered Impulsivity (*r* = .43). From the CFA, which included both the YPI and PPI-R, the YPI showed stronger psychometric properties than the PPI-R, yet including all subscales in one CFA resulted in a poor fit to the data overall.

**Self-reported delinquency**

Participants reported delinquency in five categories: violence, burglary, drugs, damage of property and minor delinquency (such as driving without permit, calling the police for no reason). The mean categorical frequencies scores were highest for the minor delinquency scale (*M* = 4.49, *SD* = 3.91, range: 0-18), and lowest scores on the property damage scale (*M* = 2.07, *SD* = 3.15, range: 0-18), violent behavior was reported with a mean of 2.17 (*SD* = 2.89, range: 0-14), drug use with a mean of 2.21 (*SD* = 3.66, range: 0-15) and burglary with a mean of 2.34 (*SD* = 2.86, range: 0-14). The mean delinquency sum was 8.53 (*SD* = 9.92) and male participants reported more criminal behavior across all categories compared to female participants, *t*’s(306) = 2.99-6.02, *p*’s <= .001 (see Table 1).

The overall delinquency score is correlated with gender (male participants reporting higher rates of delinquent behavior), with the PPI-R factors CO and SCI, but not with the FD factor, as well as with all three domains of the YPI (see Table 2).

**The construct validity of the PPI-R in predicting delinquency over and above the YPI**

Table 3 notes the correlations between psychopathy scales (as created by summing items) and the covariates. The YPI CU and GM domains were positively correlated with all three PPI-R factors, while the YPI II domain only with the PPI-R SCI factor. PPI-R SCI was correlated highest with the II domain of the YPI, FD of the PPI-R showed small correlations with both CU and GM domains of the YPI. Coldheartedness showed the highest correlation with YPI CU.

We conducted a regression where the three delinquency variables (three latent count variables and three latent binary) were regressed on the three observed PPI-R dimensions. Only age and sex were included in the first step of evaluation of the model. Sex was significant in statistically predicting all delinquency, except for the binary drug use variable, suggesting sex did not differentiate those who, regardless of level of use, did or did not use drugs. However, males trended toward greater delinquency across the count variable of drug use as well as violent delinquency and property delinquency (estimates ranging -.52 to 2.08, *SE*s ranging from .15 to .39). Younger age was associated with a greater tendency to report more incidences of violent delinquency, estimate = -.06, *SE* = .03, 95%CI = -.11,-.01.

Including the PPI-R dimensions in the second step of the model specification significantly improved model fit, Satorra-Bentler *Δ Χ2* (18) = 227.19, *p* < .001. The proportion of residual variance explained including the PPI-R ranged from 46% for violence to 18% for drug use (37% for property crime). Thus, including psychopathy as measured by the PPI-R was a significant and meaningful addition to the model. As shown in Table 4, Self-centered Impulsivity significantly predicted all forms of delinquency, both count and binary variables, suggesting greater Self-centered Impulsivity resulted in reports of engaging in delinquency at all (binary variables) and of engaging in more incidences (count variables). Fearless Dominance and Coldheartedness were related to non-violent forms of delinquency. Fearless Dominance significantly predicted reporting any engagement in property crime and reporting any drug use, and Coldheartedness predicted greater levels (count) of property crime and reported drug use.

Adding the YPI subscales to the original model (including sex and age) significantly improved model fit, Satorra-Bentler *Δ Χ2* (18) = 179.28, *p* < .001 (see Table 5). Although age statistically predicted property delinquency as above, sex predicted violence (both count and binary) and count measures of property and drug use. However, the proportion of residual variance explained including the YPI domains ranged from 44% for violence to 23% for drug use (and 27% for property crime). Although these effects were lower (in absolute terms) than what was found for the PPI-R, these effects are significant. The variance explained by all the variables in the model was similar to that using the PPI-R: *R2* ranged from .23 to .44 for the YPI compared to the range of .18 to .46 in the PPI-R regression model. Mirroring the findings including the PPI-R, the YPI impulsive-Irresponsibility scale was a significant predictor of all delinquency measures both count and binary, except for the count variable of drug use. No other subscales were significant predictors. Thus, across both measures, unique variance was accounted for by subscales of psychopathy related to impulsivity with a few exceptions using the PPI-R.

Finally, we examined whether a model with both inventories were better than any single inventory at predicting delinquency. Including both the YPI and the PPI significantly improved fit beyond the PPI alone, Satorra-Bentler *Δ Χ2* (18) = 49.681, *p* < .001, and the YPI alone, Satorra-Bentler *Δ Χ2* (18) = 80.402, *p* < .001. Figure 1 shows the significant unstandardized regression estimates. YPI impulsive-Irresponsibility continued to predict many delinquency measures, except violence. Coldheartedness positively predicted violence and Self-centered Impulsivity was related to greater likelihood to engage in violence at all (i.e., negative predictor of violence binary measure). Fearless Dominance only negatively predicted property delinquency. Thus, the impulsivity factors of the YPI and the PPI are doing the heavy lifting when statistically predicting delinquency.

**Discussion**

We investigated the construct and criterion validity of two forms of psychopathy self-report assessment measures, the PPI-R and the YPI, which – to our knowledge – have not been previously compared in youths. Despite expected correlations between YPI domains and PPI-R factors, we found a better model fit for the YPI factor specification compared to the PPI-R, but an overall moderate model fit for both measures. However, investigating relations with the construct of delinquency, we found surprisingly similar results across the PPI-R and the YPI. Both the PPI-R and the YPI explained significant variance in delinquency within our community sample. This is important, as it establishes the validity of questionnaires designed for youths and adults and these both predict delinquency. Yet, since these measures differ on their relative focus on personality traits and behavior (e.g., impulsivity), we cannot say if the variance accounted for by both the PPI-R and the YPI is due to their developmental focus or to their relative focus on personality versus behavior. At least we can suggest that, although the PPI-R self-centered impulsivity and YPI impulsive/irresponsibility overlapped considerably, each had unique relations with delinquency in the final model. Examining the developmental progression of impulsive psychopathic personality would be an important next step to explore in future studies, given the need for identifying assessments that can be administered across samples as they age to inform developmental psychopathology.

In the separate statistical predictive models, we found a strong association between self-reported violent delinquency and self-centered impulsivity (PPI-R) as well impulsive/irresponsibility (YPI) with 44 and 46% variance explained respectively; weaker relations for property crime and drug abuse were shown. Fearless dominance and coldheartedness (both from the PPI-R) as well as Callous-unemotional and grandiose-manipulative factors (both YPI) however were less predictive for all three crime categories. Examining two self-report measures of psychopathy that differed on their relative focus on personality and behavior, we found most of the variance accounted for in statistically predicting delinquency was due to the impulsive, irresponsible, thrill-seeking and self-centered impulsivity factors of both measures. For instance, callous-unemotional/coldheartedness traits and grandiose/manipulative traits did not predict delinquency over and above impulsivity-dominant dimensions. This is contrary to findings by Ansel et al. (2014), as we do not find a strong relation between the fearless and unemotional aspects of psychopathic traits with self-reported violent delinquency. Although diverging from the findings of this recent study by Ansel et al. (2014), our findings match previous results from delinquent samples, in which the impulsive and behavioral traits of psychopathy were most strongly related to criminal behavior (e.g. Vaughn, Edens, Howard, & Smith, 2009). Also, our findings are consistent with Muñoz et al. (2008) who found the impulsive dimension of the Antisocial Process Screening Device to be most associated with aggression and conduct problems at least concurrently. Interestingly, both the YPI and the PPI-R together improve statistical prediction of delinquency beyond either single measure alone. However, future research should also investigate the predictive validity of the PPI-R and YPI, as the two measures might differ in a prospective design.

People who were more delinquent endorsed impulsive-related items, whether reported on the PPI-R or the YPI, yet the PPI-R showed many more associations with delinquency than was true for the YPI dimensions. The PPI-R is a measure of psychopathy designed to tap the personality based descriptions of Cleckley (1941) while deemphasizing the role of antisocial behavior, which was seen as a byproduct of the callous, cold, manipulative, and self-centered traits related to psychopathy. Despite the strong and unique association between impulsivity and delinquency, people who were higher on Fearless dominance (measured with the PPI-R) endorsed being delinquent rather than not (binary measure). Fearlessness, then, may relate to being willing to engage in any delinquency at all in terms of a lower behavioral threshold, while Coldheartedness may relate to a greater engagement in delinquency in terms of a higher number of delinquent and violent activities (the latter shown in the combined predictive model).

In terms of the structural validity of the two measures, the CFA derived model including both measures only provided poor model fit. Although reliabilities of the dimensions, subscales and total scores were high, some subscales did not show high factor loadings on their respective dimensions, such as Blame externalization, Machiavellian egocentricity and carefree non-planfulness being poorly related to self-centered impulsivity. This is mainly the case for the subscales of the PPI-R, to a lesser extent for the YPI, which showed a good factor-analytic fit.

**Limitations**

One major limitation of the present study is the use of self-reported delinquency with a new measure. Including third-party information on the behavior of the young adults would improve the relevance and the interpretability of these findings (Falkenbach, Poythress, & Heide, 2003; Roose, Bijttebier, Claes, Decoene, & Frick, 2010). As instrumental violence has been specifically linked to callous-unemotional traits (Fanti, Demetriou, & Kimonis, 2013; White, Gordon, & Guerra, 2015), it may be useful to examine the motivations for delinquency (like has been done for reactive and proactive aggression), as motivations could be found to be premeditated or proactive within people with high psychopathic traits. In addition, our small sample was not representative and had inconsistent responders (18%), which has been found in other studies as well (Sorman et al., 2016); however that reflects that this juvenile sample might be specifically prone to inconsistent responding as the rate is higher compared to studies in adults (e.g. 5.33% in Uzieblo et al., 2010).

**Summary**

In sum, youths’ psychopathic traits as reported with both the YPI and the PPI-R and importantly, their dimensions reflect different correlates of psychopathic personality not only in adults but also in younger adults; thus, the present study adds to the support for the downward extension of psychopathy, including the PPI-R (Forth, Hart, & Hare, 1990). Young adults higher in psychopathic traits also reported engaging in delinquent activities, including violence. The PPI-R was as good as the YPI in robustly explaining delinquency. Thus, people who exhibit the *personality dimensions related to psychopathy* including fearlessness, coldhearted behavior, failing to accept blame for one’s actions, and being carefree and rebellious report engaging in decision making that results in delinquency and violence.

**Electronic Supplementary Material**

ESM 1: data file in SPSS format (ESM1\_YouthPPI\_YPI\_EJPA\_data.sav)

ESM 2: SPSS output for descriptive results (ESM2\_EJPA\_delinquency\_descriptives.spv)

ESM 3: SPSS output for correlations (ESM3\_Correlations\_EJPA\_2017.spv)

ESM 4: Spread sheet containing all YPI and PPI subscales as basis for CFA and models (ESM4\_ppi&ypi\_withoutIR.csv)

ESM 5: Spread sheet containing all YPI and PPI outliers (ESM5\_factor subscales YPI PPI outliers.csv)

ESM 6: Mplus output file for the PPI CFA (ESM6\_CFA\_PPI.out)

ESM 7: Mplus output file for the YPI CFA (ESM7\_CFA\_YPI.out)

ESM 8: Mplus output file for the overall CFA (ESM8\_CFA.out)

ESM 9: Mplus output file for model predicting delinquency by PPI and YPI (ESM9\_PPIplusYPI\_predict\_delinq.out)

ESM 10: Mplus output file for model predicting delinquency by PPI (ESM10\_PPI\_predict\_delinq.out)

ESM 11: Mplus output file for model predicting delinquency by YPI (ESM11\_YPI\_predict\_delinq.out)

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Table 1.

Means, standard deviations and reliabilities for main study variables

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | All | Male | Female |  |  |
|  | *N* = 308 | *n* = 231 | *n* = 77 | *p* | Cronbach’s *α* |
| Age | 18.63 (2.12) | 19.04 (2.60) | 18.74 (2.73) | .39 |  |
| Violent crime | 2.17 (2.89) | 2.72 (3.06) | 0.55 (1.38) | <.001 |  |
| Property damage | 2.07 (3.15) | 2.53 (3.42) | 0.69 (1.46) | <.001 |  |
| Burglary | 2.34 (2.86) | 2.67 (3.05) | 1.36 (1.91) | <.001 |  |
| Drug use | 2.21 (3.66) | 2.57 (3.97) | 1.14 (2.22) | .003 |  |
| Property damage | 2.07 (3.15) | 2.53 (3.42) | 0.69 (1.46) | <.001 |  |
| Minor delinquency | 4.49 (3.91) | 4.90 (4.20) | 3.26 (2.50) | .001 |  |
| Delinquency | 8.53 (9.92) | 10.48 (10.80) | 3.74 (4.89) | <.001 | .86 |
| YPI CU | 10.38 (2.79) | 10.84 (2.85) | 8.93 (1.92) | <.001 | .84 |
| YPI II | 11.50 (2.64) | 11.78 (2.78) | 10.94 (2.24) | .02 | .82 |
| YPI GM | 9.99 (2.61) | 10.34 (2.74) | 8.87 (1.98) | <.001 | .88 |
| YPI MEAN | 10.57 (2.21) | 10.92 (2.29) | 9.51 (1.54) | <.001 | .88 |
| PPI-R SCI | 40.00 (6.00) | 40.97 (6.36) | 38.57 (5.04) | .003 | .87 |
| PPI-R FD | 35.61 (4.92) | 36.32 (4.88) | 33.27 (4.74) | <.001 | .88 |
| PPI-R CO | 31.90 (7.52) | 32.85 (7.48) | 28.09 (5.71) | <.001 | .85 |
| PPI-R MEAN | 37.47 (3.95) | 38.21 (3.90) | 35.27 (3.23) | <.001 | .87 |

Note: *M* = mean, *SD* = standard deviation, YPI CU = callous unemotional, YPI II = impulsive irresponsible, YPI GM = grandiose manipulative, PPI-R SCI = self-centered impulsivity, PPI-R FD = fearless dominance, PPI-R CO = coldheartednessTable 2.

Loadings and standard errors (SE) of confirmatory factor analysis for PPI-R and YPI.

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | Factor Loading | *SE* |
| PPI-R SCI | Blame externalization | .34 | .06 |
|  | Machiavellian egocentricity | .48 | .05 |
|  | Carefree nonplanfulness | .47 | .05 |
|  | Rebellious nonconformity | .88 | .03 |
| PPI-R FD | Fearlessness | .60 | .07 |
|  | Social influence | .61 | .07 |
|  | Stress immunity | .57 | .07 |
| YPI GM | Dishonest charm | .84 | .03 |
|  | Grandiosity | .57 | .05 |
|  | Lying | .64 | .04 |
|  | Manipulation | .88 | .02 |
| YPI CU | Callousness | .70 | .04 |
|  | Remorselessness | .78 | .04 |
|  | Un-emotionality | .81 | .04 |
| YPI II | Thrill-seeking | .88 | .02 |
|  | Impulsiveness | .73 | .03 |
|  | Irresponsibility | .55 | .05 |

Note: PPI-R SCI = self-centered impulsivity, PPI-R FD = fearless dominance, PPI-R CO = coldheartedness, YPI GM = grandiose manipulative, YPI CU = callous unemotional, YPI II = impulsive irresponsible

Table 3.

Zero-order correlations between main study variables

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 1 | Del | - |  |  |  |  |  |  |  |  |  |  |
| 2 | Age | .02 | - |  |  |  |  |  |  |  |  |  |
| 3 | Sex | -.29\*\* | -.05 | - |  |  |  |  |  |  |  |  |
| 4 | PPI-R SCI | .56\*\*\* | -.10 | -.17\*\*\* | - |  |  |  |  |  |  |  |
| 5 | PPI-R FD | .13\* | -.004 | -.26\*\*\* | .01 | - |  |  |  |  |  |  |
| 6 | PPI-R CO | .29\*\*\* | .01 | -.28\*\*\* | .20\*\*\* | .17\*\* | - |  |  |  |  |  |
| 7 | PPI-R MEAN | .56\*\*\* | -.08 | -.32\*\*\* | .83\*\*\* | .52\*\*\* | .47\*\*\* | - |  |  |  |  |
| 8 | YPI CU | .31\*\*\* | -.001 | -.30\*\*\* | .38\*\*\* | .23\*\*\* | .59\*\*\* | .54\*\*\* | - |  |  |  |
| 9 | YPI II | .50\*\*\* | -.07 | -.14\* | .72\*\*\* | .05 | .14\*\* | .62\*\*\* | .46\*\*\* | - |  |  |
| 10 | YPI GM | .36\*\*\* | -.05 | -.24\*\*\* | .56\*\*\* | .29\*\*\* | .25\*\*\* | .63\*\*\* | .49\*\*\* | .59\*\*\* | - |  |
| 11 | YPI MEAN | .47\*\*\* | -.05 | -.28\*\*\* | .67\*\*\* | .25\*\*\* | .39\*\*\* | .73\*\*\* | .77\*\*\* | .82\*\*\* | .88\*\*\* | - |

Note: Del = Delinquency, PPI-R SCI = self-centered impulsivity, PPI-R FD = fearless dominance, PPI-R CO = coldheartedness, PPI-R MEAN = PPI-R mean score, YPI CU = callous unemotional, YPI II = impulsive irresponsible, YPI GM = grandiose manipulative, YPI MEAN = YPI mean score; \*\* p <.01, \*\*\* p < .001

Table 4: Results of negative binomial regressions with count (left of slash) and binary (right) latent variables created from delinquency subscales and predicted from the PPI-R dimensions

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Violence | | | Property | | | Drug Use | | |
|  | Estimate | SE | 95%CI | Estimate | SE | 95%CI | Estimate | SE | 95%CI |
| Age | -.05\*/ -.05 | .02/ .07 | -.09,-.003/  -.19,.08 | -.05\*/ -.12 | .02/ .08 | -.08,.01/  -.27,.04 | .05\*/ -.19\* | .03/ .07 | .002,.10/  -.32,-.06 |
| Sex | -.37/ 1.79\* | .24/ .45 | -.84,.10/  .92,2.66 | -.31\*/ .46 | .15/ .43 | -.60,-.02/  -.38,1.29 | -.24/ -.19 | .23/ .40 | -.69,.22/  -.98,.60 |
| PPI-R CO | .02/ -.02 | .01/ .03 | -.002,.03/  -.06,.03 | .02\*/ -.002 | .01/ .02 | .003,.03/  -.05,.04 | .03\*/ .02 | .01/ .02 | .01,.05/  -.02,.06 |
| PPI-R SCI | .03\*/ -.20\* | .01/ .04 | .01,,05/  -.28,-.11 | .07\*/ -.18\* | .01/ .04 | .05,.09/  -.26,-.10 | .04\*/ -.12\* | .02/ .03 | .01,.07/  -.17,-.06 |
| PPI-R FD | -.01/ -.07 | .01/ .04 | -.03,.02/  -.15,.01 | -.02/ -.14\* | .01/ .05 | -.05,.01/  -.23,-.05 | -.01/ -.06\* | .02/ .03 | -.04,.02/  -.12,-.004 |
|  | R2 = .46 | | | R2 = .37 | | | R2 = .18 | | |

Note: PPI-R CO = coldheartedness, PPI-R SCI = self-centered impulsivity, PPI-R FD = fearless dominance; binary latent variables are coded inversely.

Table 5: Results of negative binomial regressions with count (left of slash) and binary (right) latent variables created from delinquency subscales and predicted from the YPI subscales

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Violence | | | Property | | | Drug Use | | |
|  | Estimate | SE | 95%CI | Estimate | SE | 95%CI | Estimate | SE | 95%CI |
| Age | -.05\*/ -.05 | .02/ .07 | -.10,-.01/  -.20,.09 | -.04/ -.09 | .02/ .06 | -.08,.001/  -.22,.03 | .05\*/ -0.20\* | .02/ .07 | .01,.10/  -.32,-.07 |
| Sex | -.50\*/ 1.80\* | .23/ .46 | -.96,-.05/  .90,2.69 | -.43\*/ .57 | .17/ .43 | -.76,-.11/  -.27,1.41 | -.39/ -.14 | .25/ .41 | -.89,.11/  -.94,.65 |
| YPI CU | .01/ -.10 | .03/ .07 | -.05,.06/  -.23,.04 | .02/ .03 | .03/ .08 | -.04,.07/  -.13,.19 | .03/ .06 | .03/ .06 | -.04,.09/  -.06,.18 |
| YPI II | .08\*/ -.37\* | .03/ .11 | .02,.15/  -.58,-.16 | .13\*/ -.38\* | .03/ .10 | .07,.19/  -.58,-.18 | .12/ -.32\* | .03/ .08 | .06,.19/  -.48,-.17 |
| YPI GM | -.02/ -.05 | .03/ .09 | -.06,.04/  -.23,.12 | .03/ -.19 | .03/ .10 | -.03,.08/  -.38,.01 | -.04/ -.08 | .04/ .08 | -.12,.03/  -.23,.07 |
|  | R2 = .44 | | | R2 = .27 | | | R2 = .23 | | |

Note: YPI CU = callous unemotional, YPI II = impulsive irresponsible, YPI GM = grandiose manipulative; binary latent variables are coded inversely.

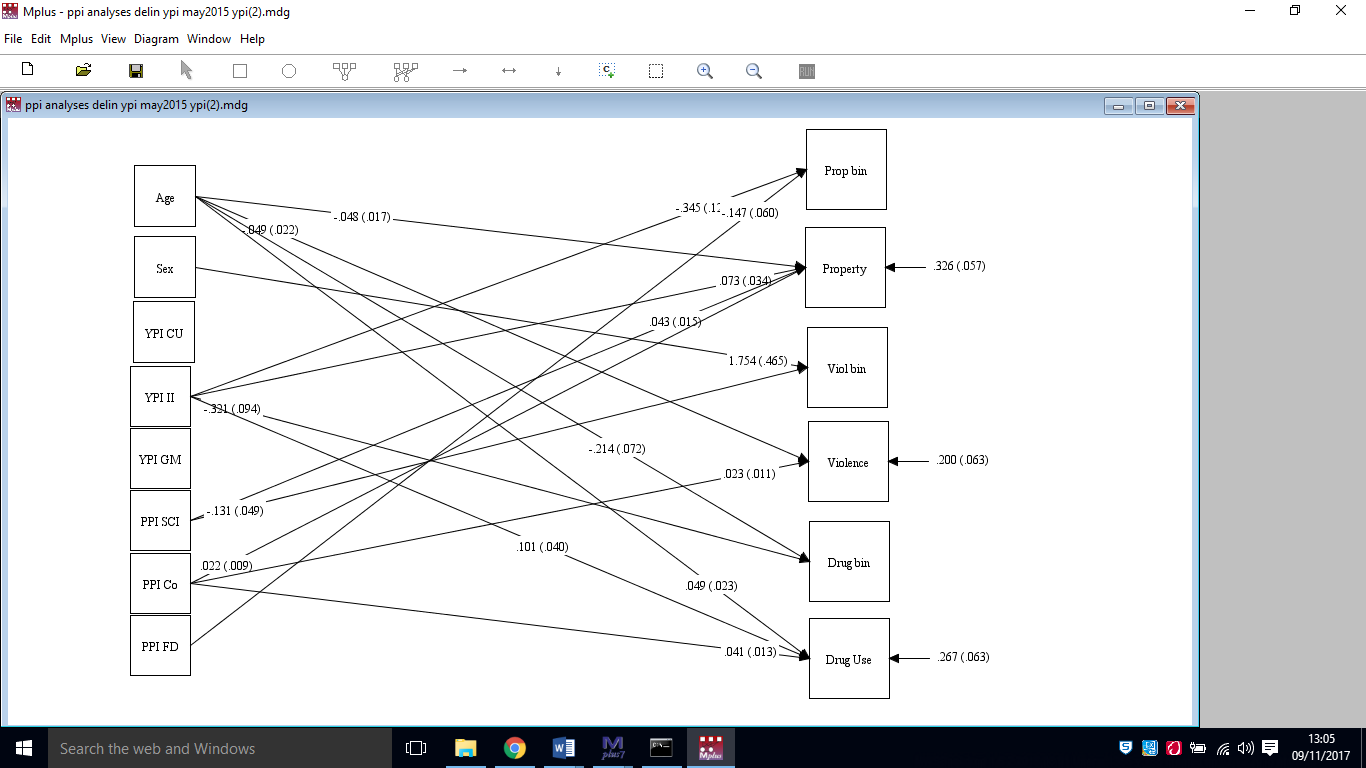


Figure 1: Results of negative binomial regressions with count and binary (“bin”) latent variables created from delinquency subscales and predicted from both the YPI and PPI subscales. Note: YPI CU = callous unemotional, YPI II = impulsive irresponsible, YPI GM = grandiose manipulative, PPI-R CO = coldheartedness, PPI-R SCI = self-centered impulsivity, PPI-R FD = fearless dominance; binary latent variables are coded inversely.