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A Validation of the Inventory of Callous-Unemotional Traits in a Community Sample of Young Adult Males

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Abstract

Callous-unemotional (CU) traits have been shown to delineate a subgroup of individuals at high risk for exhibiting severe and persistent criminal behavior. The Inventory of Callous-Unemotional Traits (ICU; Frick 2004) was recently developed as a comprehensive rating scale designed to measure multiple facets of CU traits. However, validation of this measure has been limited to youth in adolescence and emerging adulthood (age range=12–20), leaving questions about the utility of this measure in early adulthood unanswered. The current study evaluated the factor structure of the ICU within a racially diverse and well characterized community sample of adult males (*n*=425) using exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). While results found the best fitting model to be the three-bifactor structure that has been previously reported in adolescent samples, the fit indices were only marginally acceptable and suggest the need for scale refinement. Total and subscales scores demonstrated significant and distinct associations with relevant external criteria (e.g., delinquency, psychopathy, psychopathology, psychosocial functioning). Implications and directions for future research are discussed.

Keywords

Callous-unemotional traits; Psychopathy; Validation; Young adulthood; Delinquency; Psychopathology; Psychosocial functioning

Introduction

Callous-unemotional (CU) traits are an important risk factor for severe and chronic delinquency among antisocial individuals. CU traits are consistent with the affective features of psychopathy and include callousness, a lack of guilt and remorse, shallow affect, and a failure to accept responsibility for wrongdoing (Cleckley 1976). Adults with CU traits tend to have reduced emotional responsiveness to threatening stimuli (Lykken 1995; Patrick 1994) and deficient affect recognition (Marsh and Blair 2008). High levels of CU traits have also been linked to instrumental aggression (Reidy et al. 2007), increased rates of violence

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(Neumann and Hare 2008; Vitacco et al. 2005) and recidivism, particularly violent recidivism, in samples of adult males (Kahn et al. 2012; Serin 1996). Downward extension of these features to children and adolescents have revealed similar findings (for reviews see Frick 2006; Frick and Marsee 2006). Specifically, CU traits have been linked to serious aggression and delinquency both concurrently and longitudinally within child and adolescent community, clinic-referred, and forensic samples (Byrd et al. 2012; for review see Frick and White 2008). While there is some suggestion that the presence of these characteristics may provide limited predictive utility above and beyond other psychopathic features, specifically with regard to recidivism (e.g., Walters et al. 2008), the literature as whole suggests that the presence of CU traits has relevance for understanding the development and persistence of serious antisocial behavior from childhood through adulthood.

In light of these findings, there is increasing interest in understanding factors that contribute to the developmental continuity and change in CU traits over time (Burke et al. 2007; Lynam et al. 2008). Given that the transition from adolescence into early adulthood is a period of considerable developmental change, research in this area would benefit from the development of a comprehensive measure of CU traits that has been validated for use across this time period. This would allow for the examination of the stability of these features over time without the introduction of unwanted variance in test scores due to measurement differences (Khoo et al. 2006). However, nearly all youth measures of this construct have yet to be validated for use within young adult populations (for exception see Campbell et al. 2009). Moreover, many of these measures fail to comprehensively assess CU traits. Along these lines, the Psychopathy Checklist-Youth Version (PCL-YV; Forth et al. 2003) and the Psychopathy Checklist-Revised (PCL-R; Hare 1991, 2003) are two of the most commonly used assessments in youth and adult populations, respectively. However, they contain only four items that assess CU traits, limiting their ability to comprehensively assess these features. Additionally, these measures require a lengthy semi-structured interview as well as a thorough file review and thus are time consuming to administer and may not be appropriate for use in community samples (Lilienfeld and Fowler 2006). Research has also utilized several self-report measures (e.g., Antisocial Process Screening Device (APSD), Child Psychopathy Scale (CPS), Self-Report of Psychopathy-III (SRP-III)); however, these measures have not been validated for use in both adolescent and adult samples and also provide limited assessment of CU traits (APSD; Frick and Hare 2001; PPI; Lilienfeld and Andrews 1996; SRP-III; Paulhus et al. 2012). In addition, some self-report scales, such as the APSD, have shown poor reliability in adolescent samples, due in part to the limited number of items used to assess these features (Pardini et al. 2003; Poythress et al. 2006).

The Inventory of Callous-Unemotional Traits (ICU) was recently developed to address these limitations (Frick 2004). Founded upon items from the CU subscale of the APSD, the ICU is a self-report measure containing 24 items that tap multiple aspects of the affective features of the psychopathy. The scale includes items that are developmentally appropriate for use with older children as well as adults (e.g., “I do not care who I hurt to get what I want” or “I care about how well I do at school or work”). This measure has recently been factor analyzed within clinical and community samples of youth ranging from early adolescence to late adolescence/emerging adulthood (age range=12–20). Specifically, four empirical studies have tested the internal structure of the ICU, with one study employing an Exploratory Factor Analysis (EFA) and four studies utilizing a Confirmatory Factor Analysis (CFA). These studies have been conducted in several different countries and have consistently shown the three-bifactor model to provide the best fit to the data. However, as detailed below, the fit for these models has been variable.

In a large community sample of German adolescents (*n*= 1,443; age range=13–18), EFA analyses resulted in three subfactors: callousness (e.g., "I do not care who I hurt to get what I want"), uncaring (e.g., "I work hard on everything I do" reversed scored), and unemotional (e.g., "I do not show my emotions to others"; Essau et al. 2006). Within this sample, CFA analyses found CU traits to load onto these three independent subfactors as well as a fourth general 'callous-unemotional' factor, though multiple residuals had to be correlated to achieve marginal fit (e.g., GFI=.89, RMSEA=.08). Similar CFA results have been reported in a high risk sample of American adolescents (Kimonis et al. 2008) and suggest the three-bifactor model provides the best fit. However, some of the fit indices were again only marginal (e.g., CFI=.87, RMSEA=.06) and required the elimination of items 2 and 10 (due to poor factor loadings) to achieve marginal fit. More recently, two studies have shown fit indices for the bi-factor model to be in the acceptable to good range (e.g., CFI=.92–.96; RMSEA=.047–.07) in a sample of non-referred adolescents in Greek Cyprus (age range=12–18; Fanti et al. 2009) and in a community sample of Dutch adolescents (age range=14–20; Roose et al. 2010). The reliability of the total ICU score across these studies was acceptable, ranging from .79 to .81 and has been replicated in a community sample of adults (Neal and Sellbom 2012). However, the reliability of the subscales varied considerably and ranged from poor to acceptable, with the 5 item unemotional subscale consistently demonstrating the poorest reliability. Despite some concerns with fit indices in adolescent populations, the validation of this measure within young adult populations is necessary before the utility and developmental continuity of these characteristics across the critical transition from adolescence to adulthood can be adequately assessed. Thus, the first aim of the current study is to evaluate the factor structure of the ICU within an at-risk community sample of young adult males.

The second aim of the current study is to examine the construct validity of the ICU within the same sample, specifically as it relates to delinquency, other measures of psychopathy, broader psychopathology and psychosocial functioning. As stated above, there is some suggestion that CU traits may help to delineate a subgroup of individuals most at risk for serious antisocial behavior, with prior research demonstrating associations between CU traits and aggression and delinquency (Essau et al. 2006; Kimonis et al. 2008), especially violent delinquency (Lawing et al. 2010; Muñoz et al. 2008). In addition, empirical work has documented significant correlations between the ICU and other self-report psychopathy assessments in adolescents (Kimonis et al. 2008; Roose et al. 2010). All three dimensions of the ICU and the total score have shown significant correlations with APSD and CPS scores, with associations between the callousness and uncaring dimensions being most robust (*rs*=. 40–.63).

Research has also demonstrated associations between CU traits and broader psychopathology as well as impaired psychosocial functioning. Specifically, studies have documented links between higher levels of CU traits and conduct problems (Essau et al. 2006) as well as impulsive and antisocial behaviors (White et al. 2009), especially earlyonset antisocial behavior (Dandreaux and Frick 2009). In contrast, empirical work on the link between CU traits and internalizing problems has been somewhat mixed (Sevecke and Kosson 2010). Specifically, research has shown differential associations with dimensions of the ICU, with the callousness dimension showing a positive correlation with internalizing symptoms while the unemotional dimension has been shown to be inversely related to the presence of specific internalizing symptoms (Essau et al. 2006). Lastly, research has also found youth who demonstrate high scores on the ICU to show poor psychosocial functioning as indicated by poorer school functioning (DeLisi et al. 2011; Essau et al. 2006) as well as greater impairment in peer and family relationships (Essau et al. 2006).

Current Study

The current study explored the factor structure of the ICU in an at-risk community sample of racially diverse young adult males. First, an EFA was conducted. As detailed above, past validation studies report fit indices ranging from poor to acceptable. In addition, this was the first known study to examine the factor structure of the ICU in adult males; thus, exploratory techniques were utilized. Next, a CFA based on the three-bifactor model previously supported in the literature was conducted (Essau et al. 2006; Fanti et al. 2009; Kimonis et al. 2008; Roose et al. 2010). Lastly, we evaluated the validity of the ICU by examining associations between the ICU subfactors and several relevant external correlates. Building upon past research, the current study sought to include a broader range of adult outcomes, including delinquency, measures of psychopathy, alcohol/drug use, psychopathology, and psychosocial impairment.

Method

Participants

Participants in the current study are a part of the Pittsburgh Youth Study (PYS), an ongoing longitudinal study of boys initially recruited from Pittsburgh public schools in 1987–1988 (Loeber et al. 1998). This study focused on the first grade cohort from the study (youngest cohort). Participants were recruited from a random sample of 1,165 first graders who completed an initial screening assessment that included mother, teacher, and self-report of the boys' externalizing behavior problems. Utilizing this screening assessment, those boys rated in the top 30 % on externalizing behavior problems (n=256) and a roughly equal number of boys randomly selected from the remainder (n=247) were selected for follow-up assessments (N0503). Boys in the screening sample were similar to those selected for longitudinal follow-up in terms of race and achievement test scores. The mean age of boys in the youngest cohort at the first assessment was approximately 7 years (M=6.9, SD=.55) and the racial composition of the boys was primarily African American (56.3 %) and Caucasian (41.4 %). Detailed information regarding the PYS cohorts can be found in Loeber et al. (1998, 2008).

The current study focuses on the youngest cohort of boys because they completed the ICU at a recent assessment in early adulthood (M=25.78, SD=.96). Of the original follow-up sample of 503 boys, a total of 425 (85 %) completed the follow-up assessment. Among those who completed the assessment 56 % were African American and 44 % were Caucasian. We assessed for differential participation rate by comparing those who participated in the follow-up to non-participants in terms of initial risk status, race and socioeco-nomic status at the initial assessment in childhood. No consistent pattern was found with regard to initial risk status or socioeconomic status; however, non-participants were significantly more likely to be African-American.

Procedure

All measures used in the current study were collected at the age 25 follow-up assessment in early adulthood. The majority of participants were interviewed privately in their homes. Interviews were occasionally completed by phone for participants who moved outside of an acceptable driving distance. Informed written consent was obtained prior to the assessment and participants were paid for their participation. Procedures during all phases of this study were reviewed and approved by the Institution Review Board at the University of Pittsburgh.

Measures

Demographics—Age and race (coded non-African American=0 vs. **African American=1**) were assessed using a Demographic Questionnaire (Loeber et al. 1998). Participants also provided information on their education and occupation, which was used to calculate socioeconomic status (SES) using the Hollingshead Index (Hollingshead 1975).

Inventory of Callous-Unemotional Traits (ICU; Frick 2004)—The ICU scale includes 24 items that are rated on a four-point Likert scale from 0 *(not at all true)* to 3 *(definitely true)*. The measure was created to assess facets of callous and unemotional traits and was derived from the 6-item CU subscale of the self-reported APSD (Frick and Hare 2001). In order to overcome the limitations of this scale and to provide a more comprehensive assessment of CU traits, the ICU was created utilizing four of the original six items in the APSD that most consistently loaded on at CU factor ("I am concerned about the feelings of others," "I feel bad or guilty when I do something wrong," "I care about how well I do at school or work," and "I do not show my emotions to others"). For each of these four items, six additional items (3 of which were reverse scored) were created to provide a more detailed assessment of CU traits. Prior factor analytic studies have supported a three factor structure for the ICU measure, including callousness (11 items), uncaring (8 items), and unemotional (5 items) scales. A detailed description of studies examining the construct validity of the ICU is provided in the introduction.

Self-Report of Delinquency (SRD; Elliot et al. 1985)—A modified version of the SRD that was originally developed as part of the National Youth Survey was used to assess a variety of illegal activities in adulthood (Loeber et al. 2008). Participants were asked the number of times they had committed a series of different illegal acts (e.g., theft, assault, robbery, vandalism) within the past year. In the current study, prevalence of any delinquency was assessed as well as the prevalence of theft and violence. Any delinquency was calculated based on 25 items, which included all theft and violent acts as well as other forms of delinquency (e.g., vandalism, drug selling, etc.). Theft included 11 items (e.g., auto theft, stealing something more than $100, snatching a purse or wallet, etc.) and violence included 6 items (e.g., hitting someone with the intention of hurting them, using a weapon to obtain money from someone, etc.). In addition, a delinquency variety score was created by summing the total number of different delinquent acts participants reported out of 25 possible delinquent acts.

Official Record of Criminal Charges—Official record of criminal charges was collected from childhood through the early adult assessment using several sources including the Allegheny County Juvenile Court Records, the Pennsylvania Juvenile Court Judges' Commission, the Pennsylvania Police Repository, the Pennsylvania State Police and the Pennsylvania Court of Common Pleas. Records from the Federal Bureau of Investigation, which receives information regarding charges received in all 50 states, were also obtained. Several variables were created using this information, including total number of prior arrests, total number of prior charges, receipt of any theft charge (e.g., larceny, burglary, etc.) and receipt of any violent charge (e.g., murder, rape, assault, robbery, etc.).

Self-Report of Psychopathy-III (SRP-III; Paulhus et al. 2012)—The SRP-III is a self-report measure of psychopathic features developed for use with adults. This measure was designed to assess facets of psychopathy as specified by the PCL-R. Participants are asked to rate the extent to which they agree with various statements about themselves using a 5-point Likert scale (1= *disagree strongly* to 5 = *agree strongly)*. The current study focused on three scales that assessed interpersonal manipulation (e.g., "I think I could beat a lie detector"), callous affect (e.g., "Most people are wimps") and erratic lifestyle (e.g., "I've

often done dangerous things just for the thrill of it"). Each scale consists of 16 items that are summed so that higher scores indicated increased levels of psychopathic features. The SRP-III has demonstrated good reliability and evidence of construct validity in previous studies with adults (Fite et al. 2009; Mahmut et al. 2011; Neumann and Pardini in press). The internal consistencies for the interpersonal manipulation, callous affect and erratic lifestyle scales were acceptable (α=.80, α=.73 and α=.79, respectively).

Alcohol/Drug Use—Alcohol and illicit drug use was assessed using items from the Substance Use Questionnaire (SUQ; Loeber et al. 1998). To assess alcohol use, participants reported on how many days they drank alcohol in the past year. To assess heavy drinking, participants were asked to report on how many days in the past year they consumed five or more drinks in approximately two hours or less. Participants were also asked to report on how many days in the past year they used marijuana and other hard drugs for non-medical purposes (all drugs, except alcohol, nicotine, and marijuana). Due to the low base rate of hard drug use, this variable was dichotomized and coded 1 if participants reported any hard drug use in the past year and 0 if they did not use hard drugs in the past year.

Psychopathology—Information on depressive and anxiety symptoms as well as ADHD and adult antisocial personality symptoms were collected using the DSM-oriented scales of the Young Adult Self-Report (YASR; Achenbach et al. 2005). These scales contains items that a multicultural group of psychiatrists and psychologists rated as being "very consistent" with a *DSM-IV* diagnosis of major depressive episode, generalized anxiety disorder, attention deficit hyperactivity disorder (ADHD), and antisocial personality disorder (for details, see Achenbach et al. 2005). Participants were asked to rate themselves on 14 items describing depressive symptoms, 7 items describing anxiety symptoms, 13 items describing ADHD symptoms, and 20 items describing antisocial personality symptoms over the past 6 months. Items were rated on a 3-point Likert scale (i.e., 0= *not true to* 2= *very often true*). Items were summed so that higher scores indicated increased symptom levels. The internal consistency of depressive symptoms, anxiety symptoms, ADHD symptoms and antisocial personality symptoms was generally acceptable (α=.84, α=.72, α=.86 and α=.85, respectively).

Work Functioning—As a part of a Demographic Questionnaire, participants reported on whether or not they were currently employed. For those participants that reported having a job within the past 6 months (excluding being in the military), occupational functioning was assessed using 8 items from the YASR (Achenbach et al. 2005). Items included statements like "I have trouble finishing my work" or "I do things that may cause me to lose my job" and were rated on a 4-point Likert scale (i.e., 0= *not as well as I would like to* 3= *far above average*). The internal consistency for this scale was .68. Lastly, participants were asked to report on the number of times they were fired in the past 5 years as a part of a Work Skills Questionnaire (Loeber et al. 1998).

Romantic Relationships—As a part of a Sexual Activity Questionnaire (Loeber et al. 1998), participants were asked to report whether or not they were currently in a committed relationship. For those participants that reported being in a relationship in the past 6 months, relationship functioning was assessed using 8 items from the YASR (Achenbach et al. 2005). Items included statements like "I have trouble sharing responsibilities" and "I get along well with my partner" and were rated on a 4-point Likert scale (i.e., 0= *not as well as I would like to* 3= *far above average*). The internal consistency for this scale was .77. Participants also completed the Sexual Exclusivity Questionnaire, which includes 4 items that assess the number of time they had ever cheated on a partner (e.g., "How many times have you had sexual intercourse with another person not your partner?"). In addition,

participants completed a version of the Conflict Tactics Scale (Magdol et al. 1998) and reported on how many times in the past 5 years they engaged in violent (15 items) and non-physical (22 items) controlling acts against a partner. Violent acts against a partner included items like “pushed, grabbed, or shoved your partner” and “choked or strangled your partner” while non-physical acts against a partner included items like “tried to stop your partner from seeing or talking to family and friends” and “humiliated or ridiculed your partner”.

Results

Data Analysis

All factor analytic models in the current study were estimated using a mean and variance adjusted weighted least squares estimator with Mplus 4.0 (Muthén and Muthén 2006), as this estimator is strongly recommended for use with ordinal items (Flora and Curran 2004). We first conducted an exploratory factor analysis (EFA) with an oblique rotation (i.e., promax). EFA analyses allow items to load on all factors, and the number of factors extracted is determined by several criteria, specifically, the number of eigenvalues greater than 1.0, a visual inspection of scree plots, and interpretability of the solution. The strength of the item loadings was considered poor if they failed to reach a value of 0.30. Following the EFA, we conducted a CFA based on the three factor structure (i.e., callous, uncaring, and unemotional) that has been reported in the literature (Essau et al. 2006; Fanti et al. 2009; Kimonis et al. 2008; Roose et al. 2010). The CFA was conducted in three steps. First, a single factor model was estimated as the most parsimonious fit to the data. Second, a model that required items to load onto three intercorrelated factors (i.e., callousness, uncaring, and unemotional) was estimated. Lastly, we estimated a bi-factor model that forced all items to load onto a general factor as well as one of the three uncorrelated subfactors (see Fig. 1). This model differs from Model 2 in that it assumes that a portion of the variance in each item is attributable to a general callous-unemotional factor and another portion of item variance is accounted for by one of three uncorrelated factors (for a more detailed description see Patrick et al. 2007). This type of model has primarily been used in the intelligence literature (e.g., Carroll 1993; Holzinger and Swineford 1937) and differs from a hierarchal model, which assumes the subfactors are correlated and subsumed by a general factor (Gustafsson and Balke 1993).

The absolute fit of the confirmatory models was assessed using global fit indices, including the comparative fit index (CFI; Bentler 1990), the Tucker-Lewis index (TLI; Tucker and Lewis 1973), and the root mean square error of approximation (RMSEA; Steiger 1990). For the CFI and TLI, acceptable fit was defined using the conventional definition of values between 0.90 and 0.94, with values equal to or greater that 0.95 indicative of good fit (Hu and Bentler 1999). RMSEA values between 0.05 and 0.10 represent an acceptable fit, while values less than 0.05 indicate a good fit (Browne and Cudeck 1993; McDonald and Ho 2002).

To examine the construct validity of the identified ICU factors and total score, correlation analyses were conducted in SPSS (Version 17.0). Specifically, the correlation between the ICU scores and relevant external correlates were calculated. Correlations were conducted using the current subscales of the ICU (i.e., callousness, uncaring, and unemotional). In addition, partial correlations were calculated to examine the unique associations between each individual factor and external correlates after controlling for the overlap with the remaining two factors. Correlations and partial correlations were also conducted with the subfactors derived from the EFA and are available upon request.

Exploratory Factor Analysis

Results yielded three factors and the factor loading pattern is presented in Table 1. One factor consisted of 9 items related to a callous attitude towards others (e.g., "I do not care who I hurt to get what I want"; "I do not feel remorseful when I do something wrong") and the items in this factor were generally consistent with the original callousness factor. A second factor consisted of 12 items associated with an attitude characterized by a lack of caring about performance and others (e.g., "I care about how well I do at work and school"; "I do things to make others feel good"). This factor contained all of the items that were present in the original uncaring factor (*n*=8) as well as four additional items that loaded onto other factors in past studies (see Essau et al. 2006). A third and final factor (unemotional) had only 3 items related to a lack of emotional expression (e.g., "I do not show my emotions to others"; "I do not let my feelings control me"). This factor contained only two of the items from the original unemotional factor and one additional item from the original callousness factor. While these factors were very similar to those reported in the original EFA (Essau et al. 2006), one important difference was noted. Specifically, all of the reverse scored items loaded on the uncaring factor. While two of the reverse scored items demonstrated loadings onto two factors (e.g., "I always try my best"; "I am very expressive and emotional"), the highest loading was always on the uncaring factor.

Confirmatory Factor Analysis

Model fit statistics for the CFA analyses are presented in Table 2. Results indicated that Model 1 provided a poor fit to the data. Fit indices improved to some degree in Model 2, though the overall fit was still relatively poor.[1] While the bi-factor model (Model 3) demonstrated the best fit of the three models tested, neither the CFI, TLI, or RMSEA were within the acceptable range. Because all models failed to achieve satisfactory fit, one additional model was tested. Specifically, a variant of Model 3 that allowed for correlations between residuals was estimated. Correlated residuals were estimated if modification indices indicated that the addition of the parameter would reduce the model chi-square by greater than 20 points (*n*=5). Using these criteria, the residual variance of items 10 and 12 were correlated with items 6 and 22 and the residual variance of items 6 and 22 were also correlated. Following these modifications, the TLI and RMSEA indicated acceptable model fit, but CFI, though improved, was still indicative of a marginally acceptable fit.

Table 3 (also see Fig. 1) presents the factor loadings for the bi-factor model with correlated residuals (Model 4), which represented the best fitting model. Those items specific to the uncaring factor demonstrated the strongest loadings on the general factor, with factor loadings ranging from .51 to .81 (allp's<.05). Factor loadings on the uncaring factor were generally low (range=.02–.29) with two exceptions; "I care about how well I do at school or work" and "I always try my best". In contrast, those items specific to the callous factor loaded more strongly on the subfactor than the general factor. Two exceptions were items 10 ("I do not let my feelings control me") and 8 ("I am concerned about the feelings of others"). Item 10 loaded poorly on both the general factor and the callous factor, while item 8 loaded strongly on the general factor but poorly on the callous factor. Overall, items specific to the unemotional factor loaded stronger on the unemotional factor than the general factor.

[1]The original, rationally derived four factor model was also tested (see Kimonis et al. 2008). This model required items to load onto four intercorrelated factors (i.e., careless, callousness, uncaring, and unemotional). Results indicated poor fit (χ^2=812.203; *CFI=0.704*; *TLI= 0.726*; *RMSEA*=0.164).

Internal Consistency

The coefficient alpha for the ICU total score was .80. The reliability for each of the three original three subscales was .70 .84, and .55 for callousness, uncaring, and unemotional, respectively. Correlations between subscales were low to moderate and ranged from .18 to . 34. The callousness sub-scale showed the strongest correlation with the uncaring subscale (*r*=.25) followed by the unemotional subscale (r=.18). The uncaring and unemotional subscales showed the most robust correlation (r=.34).

Construct Validity

Descriptive statistics for all study variables are represented in Table 4. Bivariate and partial correlations between the ICU total and subscales scores and all external criteria are shown in Table 5. Initial correlations indicated that age was positively associated with ICU total score and the uncaring subscale. However, these associations were reduced to non-significance after controlling for overlap between subscales. Race was positively correlated with the ICU total score as well as the uncaring and unemotional subscale. Only the unemotional subscale continued to demonstrate a significant positive association with race after controlling for common variance between subscales. SES was negatively associated with the ICU total score and all subscales, but after controlling for common variance between subscales, only the uncaring sub-scale demonstrated a unique association with SES.

Delinquency—The ICU total score was significantly correlated with all measures of self-reported delinquency. The callousness subscale was associated with all of the self-report delinquency outcomes and the uncaring subscale was most robustly associated any delinquency, violence and delinquency variety. In contrast, the unemotional sub-scale was not significantly correlated with any measures of self-reported delinquency. After controlling for the common variance between subscales, the callousness subscale continued to be associated with all measures of self-reported delinquency, while associations with the uncaring subscale were reduced to non-significance.

The ICU total score was also significantly correlated with all measures of official criminal charges, with the uncaring subscale demonstrating the most robust associations with each of these measures. The callousness subscale showed associations with number of arrests, number of charges and any violent arrest, while the unemotional subscale was significantly correlated with number of arrests and number of charges. After controlling for the overlap between subscales, only the uncaring subscale continued to show significant associations with all official record outcomes.

Self-Report Psychopathy—The ICU total score and all sub-scales demonstrated significant associations with all three factors of the SRP-III and the strongest correlations were with the callous affect scale of the SRP-III. The callousness subscale of the ICU evidenced the most robust correlations with all three factors of the SRP-III. After controlling for variance shared among subscales, similar associations were noted with one exception; the unemotional subscale was only correlated with the callous affect scale of the SRP-III, but not the other two factors.

Alcohol/Drug Use—The ICU total score and the uncaring subscale were significantly associated with heavy drinking, marijuana use, and hard drug use. The callousness subscale also showed significant associations with heavy drinking and marijuana use, but was unrelated to hard drug use. Partial correlations revealed similar associations. The callousness subscale was uniquely related to heavy drinking and marijuana use, while the uncaring subscale continued to be associated with marijuana use.

Psychopathology—Higher ICU total scores were positively correlated with increased depression, ADHD, and antisocial personality symptoms. The callousness subscale appeared to be driving these associations with positive correlations with all of the symptoms scales. All subscales showed a positive association with antisocial personality symptoms. The uncaring subscale demonstrated a negative association with anxiety symptoms, such that higher scores on the uncaring dimension were associated with significantly less anxiety symptoms. These associations remained significant even after accounting for the shared variance among the subscales with a few exceptions. The uncaring subscale was uniquely negatively associated with both depression and anxiety symptoms and only the callousness subscale showed a unique association with antisocial personality symptoms.

Psychosocial Functioning—The ICU total score, and specifically the uncaring dimension, was significantly associated with all aspects of poor work functioning, including unemployment, poorer occupational functioning and a greater likelihood of being fired. In addition, the callousness sub-scale was negatively associated with occupational functioning while the unemotional subscale was negatively correlated with full-time employment. After controlling for common variance between subscales, associations with the callousness and uncaring subscales remained significant.

While ICU total and subscales score were unrelated to being in a committed relationship, ICU total and subscales scores were associated with indices of impaired relationship functioning. Specifically, the callousness subscale was associated with an increased likelihood of cheating on a partner as well as committing violent and non-violent acts against a partner. Similarly, the uncaring subscale was associated with poorer relationship functioning, cheating and violent acts against a partner. The unemotional subscale was negatively associated with relationship functioning. Partial correlations were largely similar.

Discussion

Considerable theory and research have emphasized the importance of the affective features of psychopathy (i.e., CU traits) and suggest that these characteristics may serve to delineate a sub-group of individuals with severe and recalcitrant delinquency (Frick and White 2008). There has been recent emphasis on understanding the development and stability of these characteristics across the lifespan, placing increasing importance on the need to validate a comprehensive and reliable measure of these traits across multiple stages of development. The current study sought to extend the validation of the ICU from adolescent and emerging adult samples to a racially diverse community sample of young adult males. Overall, results of the factor analysis found the best fitting model to be the three-bifactor structure, replicating previous work in younger samples. However, as has been shown in prior validation studies, fit statistics as well as reliability indices ranged from acceptable to poor and suggest the need for the refinement of this measure. Nonetheless, total and subscales scores demonstrated significant and distinct associations with relevant external criteria, including delinquency, psychopathy, psychopathology, and psychosocial functioning.

ICU Factor Structure

Replicating previous findings, results from the EFA indicated that the ICU captures three distinct dimensions of behavior, including callousness, uncaring, and unemotional characteristics (Essau et al. 2006). However, factor loadings differed slightly in that reversed scored items loaded onto the uncaring factor. Though one previous study with adolescents found that the uncaring factor consists solely of reverse scored items, this study also found that the callousness and unemotional dimensions contained a few items that were reverse scored (Essau et al. 2006). While the current results differ slightly from the original EFA

findings, both studies suggest that the ICU measure contains a factor composed solely of reverse scored items. Interestingly, the CU items from which the ICU scale was originally developed were worded in a positive direction and reverse scored. In addition, other measures of CU traits in youth consist primarily of reverse scored items (Dadds et al. 2005; Viding et al. 2005). Some have suggested that this represents a personality characteristic consistent with "prosociality" and that these positive characteristics may differ in meaningful ways from behaviors that are overtly cold and callous (Lahey and Waldman 2003). The measurement of low levels of "prosociality" in youth may provide meaningful information as these characteristics have proven to be indicative of severe forms of delinquency, both cross-sectionally and longitudinally (Frick and White 2008; Kahn et al. 2012). However, it is important to note that this may represent, at least in part, a method factor in which any positively worded items share some common variance. Because the ICU measure does not contain positively worded items that would theoretically be distinct from empathy and guilt, such as good behavioral control, it is unclear if these items represent a unique factor that is not accounted for primarily by method variance.

Findings from the CFA demonstrated that the overall fit statistics for the proposed factor structure of the ICU measure were marginally acceptable, which is largely consistent with prior factor analytic studies conducted in youth (Essau et al. 2006; Fanti et al. 2009; Kimonis et al. 2008; Roose et al. 2010). While a three-bifactor structure demonstrated the best fit to the data, several residual covariances needed to be specified to improve the overall model fit. Previous studies also specified several residual covariances among items in order to obtain fit statistics that were in the poor to good fit range (i.e., CFI=.70–.92; RMSEA=.05–.08). This suggests that the factor structure of the ICU measure is relatively complex and further revisions of the measure may be needed in order to more cleanly delineate facets of CU traits in both adolescents and adults. Despite these notable problems, most of the factor analytic studies conducted to date have not recommended revising the ICU measure to improve its psychometric properties.

Another issue that arose when examining the factor loadings from the three-bifactor model is that only reverse scored items loaded adequately onto the general factor. This mimicked results from the EFA analysis and suggests that there is a possible method factor underlying the common variance across these items. Previous studies using CFA to examine the structure of the ICU measure with adolescents have also found that the reverse scored items show the highest loadings on the general factor, with relatively few negatively worded items showing significant loadings on this factor (Fanti et al. 2009; Kimonis et al. 2008). After accounting for the item variance attributable to the general factor, only two of the reverse scored items showed loadings on the "uncaring" factor above .30. These items had to do with working diligently on tasks, which is indicative of lack of concern about performance, not others' feelings and emotions. Taken together, these results suggest that revisions to the current measure may prove beneficial, paying particular attention to those that require reverse scoring.

Construct Validity

While marginal fit indices underscore the need for further refinement of this measure, research suggests that poor model fit has been shown for personality measures with evidence of reliability and validity (Hopwood and Donnellan 2010). As such, the current study sought to place these findings in the context of the broader literature by exploring associations with external correlates as an additional validation criterion. We found the ICU total score to be significantly associated with nearly all outcomes examined in the current study. Specifically, ICU total score demonstrated significant associations with all measures of delinquency (self-reported and official record), replicating previous research that has demonstrated strong correlations with antisocial behavior (Essau et al. 2006; Fanti et al. 2009; Kimonis et al.

2008; Roose et al. 2010). The ICU total score demonstrated robust associations with all three factors of the SRP-III, though the strongest correlations seen were features of callous affect and interpersonal manipulation. This echoes associations seen among adolescents showing that the factors of the ICU are significantly correlated with other measures of psychopathic features (Essau et al. 2006; Roose et al. 2010) and provides support for the utility of this measure within adult populations. In addition, ICU total scores showed stronger correlations with psychopathic traits than with antisocial personality symptoms, suggesting these characteristics are related to but distinct from symptoms associated with antisocial personality disorder.

Moreover, the ICU total score was significantly correlated with indices of alcohol/drug use. This further clarifies previous work that has documented high rates of comorbidity between psychopathy and substance use (Derefinko and Lynam 2006; Smith and Newman 1990; Touriana et al. 1997) and suggests CU traits in particular are associated with an increased risk for engaging in heavy drinking as well as marijuana and other hard drug use. In addition, higher ICU scores were associated with lack of employment and poorer occupational functioning. Lastly, while ICU scores were unrelated to the likelihood of being in a committed relationship, they were significantly associated with impaired relationship functioning, infidelity, and violent and non-violent acts toward a partner. These results build upon findings within adolescent populations that have documented links between higher CU traits and poor school performance, impaired peer relationships and difficulties with home duties (Essau et al. 2006; Frick et al. 1994). Moreover, these results are in line with traditional conceptualizations of these characteristics and highlight associations between CU traits and poor functioning across multiple domains (Frick and White 2008).

Associations with the ICU subscales mirrored correlations seen with the ICU total score. Despite the fact that the sub-scales were only moderately correlated, they were generally related to common external correlates. At the same time, several unique associations were found. As in previous studies with adolescents (Essau et al. 2006; Fanti et al. 2009; Kimonis et al. 2008; Roose et al. 2010), the callousness dimension was most robustly associated with self-reported measures of delinquency even after controlling for the other subscales. Interestingly, the uncaring dimension was uniquely associated with official record of offending as indicated by the number of prior arrests, number of prior charges, and any arrest for theft or violence. Kimonis et al. (2008) reported similar associations in a group of detained adolescents, with the uncaring dimension showing the strongest associations with delinquency engagement. This suggests that while callousness may be most associated with engaging in delinquent acts, a lack of concern about one’s performance as well as the feelings of others may be more closely linked to a history of chronic involvement in the criminal justice system.

While all of the subscales were positively associated with externalizing psychopathology (e.g., ADHD symptoms, antisocial personality symptoms), the callousness and uncaring dimensions showed opposite associations with internalizing symptoms. Higher scores on the callousness subscale were associated with significantly more depressive and anxiety symptoms, while the uncaring subscale was associated with significantly less anxiety symptoms, and after controlling for the overlap between subscales, less depressive symptoms. Prior research has suggested that the positive association between callousness and internalizing symptoms is most likely linked to its robust associations with externalizing symptoms. Specifically, externalizing symptoms are often associated with high levels of emotional distress and often co-occur with symptoms of depression and anxiety (Frick et al. 1999).

The unemotional subscale showed non-significant or poor correlations with the majority of external correlates. While the unemotional subscale was positively correlated with official record of arrest and antisocial personality symptoms, these associations were weak and were reduced to non-significance after controlling for other subscales. These findings are in line with previous research, and suggest that characteristics associated with a lack of emotional expression alone may be less closely linked to delinquency. At the same time, the unemotional subscale was consistently associated with facets of the SRP-III; however, only its association with the callous affect subscale of the SRP-III remained significant after controlling for the other sub-scales. Since this ICU subscale consisted of only a few items, more refinements to the items indexing this construct may be needed. Future studies on unemotionality may benefit from differentiating between different types of affect since individuals high on psychopathy tend to experience intense negative emotions related to externalizing problems (e.g., anger), but tend to have blunted emotions associated with personal distress (e.g., sadness, fear).

Limitations, Strengths, and Future Directions

The current findings should be considered in light of several limitations. First, all measures in the current study were based on self-report, with the exception of official criminal records, which could inflate results due to method variance. Though significant associations were still seen in the expected direction, future research should seek to utilize multiple informants as well as multiple methods across different samples. Moreover, the current sample represents a high-risk population and the extent to which these results may generalize to other community samples is unclear. Next, results were cross-sectional in nature and limit conclusions about the predictive utility of these traits. As such, longitudinal studies assessing associations over time could be particularly informative. Lastly, differences in the direction and strength of associations seen between the callousness and uncaring subscales in particular should be interpreted with caution. As noted above, most of the callousness items are negatively worded while all of the uncaring items are positively worded, and as such, it is possible that differential associations are attributable to method variance as opposed to construct variance.

In sum, the current study extends the validation of the ICU to a large community sample of young adult males. While results suggest further investigation of a potential method factor and question the utility of the total ICU score, EFA and CFA analyses largely replicated previous research and provided support for the presence of three distinct factors. However, marginally acceptable fit and reliability indices in the current investigation as well as past research emphasize the need for efforts to refine the current measure. Scores on the ICU were found to be significantly associated with both self-report and official record of delinquency, psychopathy, alcohol/drug use, psychopathology, and impaired psychosocial functioning. This suggests that individuals with heightened levels of CU traits may be at risk for delinquency, psychopathology, and significant psychosocial impairment. This combined with previous research suggests that this risk exists across multiple developmental stages and underscores the need to further refine this measure as it may be critical to enhancing the measurement and understanding of CU traits throughout the lifespan.

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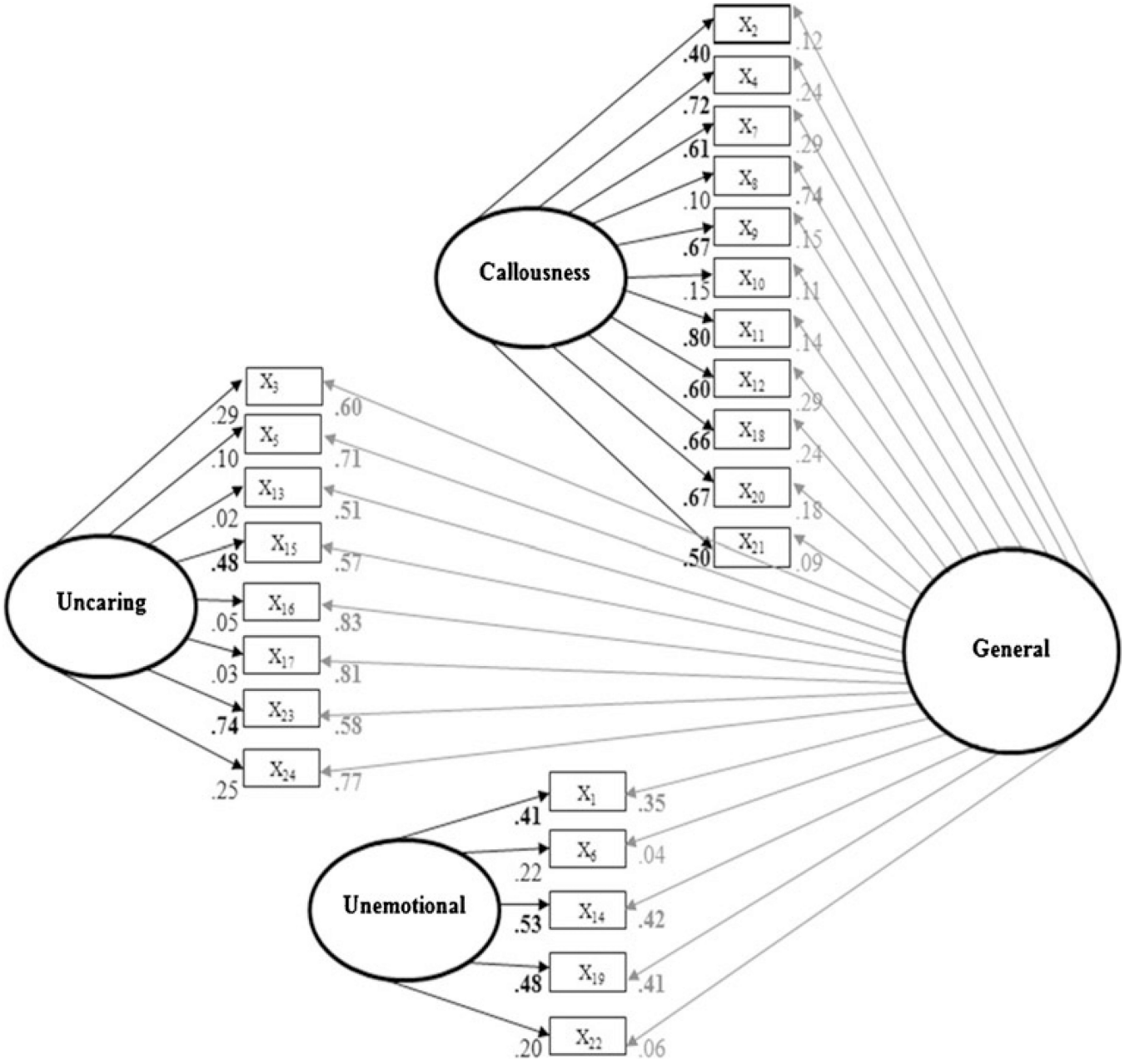

Fig. 1.

CFA: Bi-Factor model with correlated residuals. Loadings depicted in bold font are significant; General factor loadings are depicted in gray; Subfactor loadings are depicted in black; Residuals are not depicted for clarity; Correlated residuals are as follows 1) eICU22 with eICU12=.*42*; 2) eICU10 with eICU6=.*34*; 3) eICU12 with eICU6=.*39*; 4) eICU22 with eICU6=.*45*; 5) eICU22 with eICU10 = *28*

Table 1

EFA: Factor structure of the ICU

Items		Factor 1	Factor 2	Factor 3
Callousness				
11	I do not care about doing things well.	0.81	−0.03	0.09
20	I do not like to put the time into doing things well.	0.77	0.00	−0.15
4	I do not care who I hurt to get what I want.	0.72	0.09	0.07
7	I do not care about being on time.	0.65	0.13	−0.04
18	I don't feel remorseful when I do something wrong.	0.64	0.09	0.11
9	I do not care if I get into trouble.	0.64	0.01	0.20
12	I seem very cold and uncaring to others.	0.57	0.17	0.31
21	The feelings of others are unimportant to me.	0.47	−0.01	0.12
2	What I think is right and wrong is different from what other people think.	0.42	−0.21	0.11
Uncaring				
24	I do things to make others feel good.[a]	−0.03	0.83	−0.15
16	I apologize ("say I'm sorry") to persons I hurt. *a*	0.09	0.77	0.02
17	I try not to hurt others feelings. *a*	0.17	0.74	−0.03
23	I work hard on everything I do.[a]	0.08	0.73	−0.43
8	*I am concerned about the feelings of others.*[a]	*0.10*	*0.70*	*0.07*
15	I always try my best.[a]	0.25	0.63	−0.39
5	I feel bad or guilty when I do something wrong.[a]	0.14	0.63	0.03
3	I care about how well I do at school or work.[a]	0.18	0.60	−0.25
19	*I am very expressive and emotional.*[a]	*−0.40*	*0.57*	*0.25*
13	I easily admit to being wrong.[a]	−0.13	0.56	−0.03
14	*It is easy for others to tell how I am feeling.*[a]	*−0.26*	*0.53*	*0.27*
1	*I express my feelings openly.*[a]	*−0.14*	*0.42*	*0.17*
Unemotional				
22	The feelings of others are unimportant to me.	−0.03	0.31	0.57
6	I do not show my emotions to others.	0.00	0.19	0.63
10	I do not let my feelings control me.	−0.14	0.07	0.42

Italicized items do not correspond to item loadings from the original factor analysis (see Essau et al. 2006)

[a]Items that require reverse scoring before calculation of the total score

Table 2

Fit indices comparing the confirmatory factor models for the ICU

Model	df	χ^2	CFI	TLI	RMSEA
Model 1: Unidimensional Model	66	919.699	0.661	0.692	0.174
Model 2: Three-Factor Intercorrelated Model	72	772.840	0.722	0.768	0.151
Model 3: Bi-Factor Model	79	516.664	0.826	0.868	0.114
Model 4: Bi-Factor Model (with correlated residuals)	78	375.407	0.882	0.909	0.095

CFI comparative fit index; *TLI* Tucker-Lewis index; *RMSEA* root mean square error of approximation

Table 3

CFA: Bi-Factor model with correlated residual

Items		General	Callousness	Uncaring	Unemotional
Callousness					
11	I do not care about doing things well.	0.14 ns	0.80		
4	I do not care who I hurt to get what I want.	0.24	0.72		
9	I do not care if I get into trouble.	0.15	0.67		
20	I do not like to put the time into doing things well.	0.18	0.67		
18	I don't feel remorseful when I do something wrong.	0.24	0.66		
7	I do not care about being on time.	0.29	0.61		
12	I seem very cold and uncaring to others.	0.29	0.60		
21	The feelings of others are unimportant to me.	0.09 ns	0.50		
2	What I think is right/wrong is different from what other people think.	0.12	0.40		
10	I do not let my feelings control me.	0.11	0.15		
8	I am concerned about the feelings of others.[a]	0.74	0.10		
Uncaring					
23	I work hard on everything I do.[a]	0.58		0.74	
15	I always try my best. [a]	0.57		0.48	
3	I care about how well I do at school or work. [a]	0.60		0.29	
24	I do things to make others feel good. [a]	0.77		0.25	
5	I feel bad or guilty when I do something wrong. [a]	0.71		0.10 ns	
16	I apologize ("say I'm sorry") to persons I hurt. [a]	0.83		0.05 ns	
17	I try not to hurt others feelings. [a]	0.81		0.03 ns	
13	I easily admit to being wrong. [a]	0.51		0.02 ns	
Unemotional					
14	It is easy for others to tell how I am feeling. [a]	0.42			0.53
19	I am very expressive and emotional. [a]	0.41			0.48
1	I express my feelings openly. [a]	0.35			0.41
6	I do not show my emotions to others.	0.04 ns			0.22

Items		General	Callousness	Uncaring	Unemotional
22	I hide my feelings from others.	0.06 ns			0.20

[a]Items that require reverse scoring before calculation of the total score

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Table 4

Descriptive statistics for all study variables

	Mean/%	SD	Range
ICU Scores			
Total Score	22.12	7.88	4–42
Callousness	6.09	3.82	0–26
Uncaring	8.48	4.56	0–23
Unemotional	7.55	2.55	0–15
Demographics			
Age	25.78	0.96	23–28
Race (African-American)	56 %	–	–
SES	29.66	11.78	6–63
Self-Report of Delinquency			
Any Delinquency	31 %	–	–
Theft	7%	–	–
Violence	22 %	–	–
Delinquency Variety	1.52	2.04	0–13
Official Record			
Number of Arrests[a]	4.08	5.27	0–26
Number of Charges[a]	11.62	16.79	0–96
Theft	33 %	–	–
Violence	34 %	–	–
Self-Report of Psychopathy (SRP)			
Interpersonal Manipulation	39.77	8.70	22–70
Callous Affect	42.49	7.57	21–67
Erratic Lifestyle	44.42	9.18	18–73
Alcohol/Drug Use (past year)			
Alcohol Use[a]	85.78	101.80	0–365
Heavy Drinking[a]	12.85	36.38	0–300
Marijuana Use[a]	60.00	121.76	0–365
Hard Drug Use	11 %	–	–
Psychopathology			
Depression	2.91	3.71	0–23
Anxiety	3.14	2.47	0–13
ADHD	4.16	4.24	0–24
Antisocial Personality	4.61	4.86	0–32
Work Functioning			
Employed Full Time	72 %	–	–
Occupational Functioning[b]	50.64	7.56	29–58
Number of Times Fired	0.15	0.44	0–3
Romantic Relationships			

	Mean/%	SD	Range
Committed Relationship	57 %	–	–
Relationship Functioning[c]	47.43	9.40	26–60
Cheated on Partner	7.81	7.86	0–20
Violent Acts Against Partner	0.78	1.91	0–15
Non-violent Controlling Acts	1.19	2.37	0–17

SD standard deviation; *ICU* Inventory of Callous-Unemotional Traits; *SES* Socioeconomic Status; *ADHD* Attention Deficit-Hyperactivity Disorder

[a] Variables were log transformed for correlation analyses due to skewed distribution

[b] Only those participants who reported being employed full-time were assessed for occupational functioning (*n*=345)

[c] Only those participants who reported being in a committed relationship were assessed for relationship functioning (*n*=173)

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Table 5

Bivariate and partial correlations between ICU scores and relevant external criteria

	Total Score	Callousness		Uncaring		Unemotional	
Demographics							
Age	**.12***	.07	(.04)	**.11***	(.08)	.07	(.04)
Race (African-American)	**.18****	.08	(.04)	**.14****	(.09)	**.16****	(**.12***)
SES	**−.25****	**−.13****	(−.06)	**−.27****	(**−.24****)	**−.10***	(−.01)
Self-Report of Delinquency							
Any Delinquency	**.17****	**.18****	(**.16****)	**.12***	(.07)	.04	(−.02)
Theft	**.15****	**.18****	(**.16****)	.06	(.00)	.09	(.06)
Violence	**.17****	**.18****	(**.16****)	**.11***	(.06)	.06	(.01)
Delinquency Variety	**.21****	**.23****	(**.20****)	**.15****	(.09)	.07	(.01)
Official Record							
Number of Arrests[a]	**.33****	**.17****	(.09)	**.34****	(**.28****)	**.17****	(.06)
Number of Charges[a]	**.32****	**.15****	(.07)	**.33****	(**.28****)	**.17****	(.06)
Theft	**.18****	.09	(.05)	**.23****	(**.23****)	.05	(−.09)
Violence	**.22****	**.13***	(.08)	**.26****	(**.25****)	.03	(−.07)
Self-Report of Psychopathy (SRP)							
Interpersonal Manipulation	**.50****	**.50****	(**.45****)	**.35****	(**.25****)	**.17****	(.01)
Callous Affect	**.60****	**.54****	(**.49****)	**.39****	(**.24****)	**.34****	(**.22****)
Erratic Lifestyle	**.39****	**.39****	(**.34****)	**.24****	(**.13****)	**.19****	(.09)
Alcohol/Drug Use (past year)							
Alcohol Use[a]	− 07	.01	(.02)	−.07	(−.04)	−.09	(−.07)
Heavy Drinking[a]	**.13***	**.13***	(**.11***)	**.11***	(.08)	.01	(−.04)
Marijuana Use[a]	**.19****	**.16****	(**.13***)	**.15****	(**.10***)	.09	(.03)
Hard Drug Use	**.13***	.09	(.06)	**.10***	(.06)	.08	(.05)
Psychopathology							
Depression	**.18****	**.34****	(**.35****)	−.01	(**−.10***)	.05	(.02)

	Total Score	Callousness		Uncaring		Unemotional	
Anxiety	−.05	**.14****	(**.18**)	**−.15****	(**−.19**)	−.04	(.00)
ADHD	**.20****	**.35****	(**.35**)	.06	(−.01)	.00	(−.07)
Antisocial Personality	**.37****	**.48****	(**.46**)	**.18****	(.06)	**.11***	(.01)
Work Functioning							
Employed Full Time	**−.21****	−.09	(−.03)	**−.22****	(**−.18**)	**−.13****	(−.06)
Occupational Functioning[b]	**−.35****	**−.40****	(**−.37**)	**−.23****	(**−.17**)	−.04	(.09)
Number of Times Fired	**.11***	.06	(.03)	**.12****	(**.11***)	−.03	(−.01)
Romantic Relationships							
Committed Relationship	.05	.02	(.00)	.05	(.03)	.05	(.04)
Relationship Functioning[c]	**−.25****	−.15	(.09)	**−.19***	(−.11)	**−.21****	(**−.15***)
Cheated on Partner	**.19****	**.17****	(**.14**)	**.13****	(.08)	.09	(.04)
Violent Acts Against Partner	**.12***	**.15****	(**.14**)	**.10***	(**.10***)	−.05	(**−.10***)
Non-violent Controlling Acts	**.16****	**.27****	(**.26**)	.06	(.02)	−.02	(−.07)

Items in bold significant *$p \leq .05$

**$p \leq .01$

Partial correlations presented in parentheses; *SES* Socioeconomic Status; *ADHD* Attention Deficit-Hyperactivity Disorder

[a] Variables were log transformed for correlation analyses due to skewed distribution

[b] Only those participants who reported being employed full-time were assessed for occupational functioning (n=345)

[c] Only those participants who reported being in a committed relationship were assessed for relationship functioning (n=173)