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## Multi-method Assessment of Psychopathy in Relation to Factors of Internalizing and Externalizing from the Personality Assessment Inventory: The Impact of Method Variance and Suppressor Effects

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### Abstract

Research to date has revealed divergent relations across factors of psychopathy measures with criteria of internalizing (INT; anxiety, depression) and externalizing (EXT; antisocial behavior, substance use). However, failure to account for method variance and suppressor effects has obscured the consistency of these findings across distinct measures of psychopathy. Using a large correctional sample, the current study employed a multi-method approach to psychopathy assessment (self-report, interview/file review) to explore convergent and discriminant relations between factors of psychopathy measures and latent criteria of INT and EXT derived from the Personality Assessment Inventory (PAI; L. Morey, 2007). Consistent with prediction, scores on the affective-interpersonal factor of psychopathy were negatively associated with INT and negligibly related to EXT, whereas

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scores on the social deviance factor exhibited positive associations (moderate and large, respectively) with both INT and EXT. Notably, associations were highly comparable across the psychopathy measures when accounting for method variance (in the case of EXT) and when assessing for suppressor effects (in the case of INT). Findings are discussed in terms of implications for clinical assessment and evaluation of the validity of interpretations drawn from scores on psychopathy measures.

## Keywords

Psychopathy; Internalizing; Externalizing; Method Variance; Suppressor Effects

Studies evaluating the validity of psychopathy measures often reveal a theoretically meaningful pattern of convergent and discriminant relations with external criteria across subfactors of these measures (e.g., Hare, 2003; Harpur, Hare, & Hakstian, 1989; Smith & Newman, 1990). The psychopathological domains of *internalizing* (INT; unipolar depression, anxiety disorders) and *externalizing* (EXT; antisocial behavior, substance use disorders) illustrate this pattern. Research to date suggests that INT criteria evince an inverse relationship with scores on the affective-interpersonal factor of psychopathy – defined by core personality features such as superficial charm, grandiosity, manipulation, and shallow affect (Frick, Lilienfeld, Ellis, Loney, & Silverthorn, 1999; Hicks & Patrick, 2006; Verona, Hicks, & Patrick, 2005), and a positive association with scores on the social deviance factor – marked by chronic behavioral features of antisociality (e.g., impulsivity, aggression). Conversely, EXT criteria exhibit modest to negligible associations with scores on the affective-interpersonal factor while converging strongly with the social deviance factor (Hare, 2003; Patrick, Hicks, Krueger, & Lang, 2005). However, fundamental issues in assessment – such as the *method* of assessment across predictors and criteria and the moderating role of *suppressor effects* on predictor-criterion relations – cloud the consistency of these findings.

The present study utilized a large sample of offenders to examine if there is a consistent pattern of convergence and divergence between INT and EXT criteria and factors of psychopathy by assessing psychopathy in two different measurement domains (i.e., self-report, interview/file review) and testing for suppressor situations. Lilienfeld's Psychopathic Personality Inventory (PPI; Lilienfeld & Andrews, 1996) – a self-report measure, and Hare's Psychopathy Checklist-Revised (PCL-R; Hare, 1991, 2003) – an interview and file review-based measure, were used to assess whether relations with latent criteria of INT and EXT, derived from a commonly used self-report inventory of personality and psychopathology, were consistent across these distinct yet complementary indices of psychopathy.

## The Structure of Common Mental Disorders: Latent Criteria of Internalizing and Externalizing

Factor analytic work using large diagnostic datasets reveals that common mental disorders in adulthood cohere around higher-order factors of INT and EXT (Krueger, 1999; Krueger, Caspi, Moffitt, & Silva, 1998; Vollebergh et al., 2001). EXT encompasses the shared variance among child and adult antisocial behavior along with alcohol and drug dependence and can be viewed as a broad vulnerability for disinhibitory psychopathology (Krueger et al., 2002). Recently, Krueger, Markon, Patrick, Benning, and Kramer (2007) advanced a hierarchical conceptualization of the externalizing spectrum that included specification of a general EXT factor along with separable subfactors related to aggression and substance use. INT reflects the shared variance between unipolar depression and anxiety disorders and may be conceptualized as the general propensity to experience high negative emotionality (NEM) in

terms of fear, sadness, worry, and distress (Mineka, 1998). When estimated as latent factors, INT and EXT tend to be moderately intercorrelated ( $r = .5$ ; Krueger & Markon, 2006).

In the current work, we used the Personality Assessment Inventory (PAI; Morey, 2007), a self-report measure of personality and psychopathology, to derive latent criterion variables of INT and EXT. Prior factor analyses of the PAI scales have yielded factors analogous to INT and EXT (Frazier, Naugle, & Haggerty, 2006; Ruiz & Edens, 2008). INT and EXT have traditionally been conceptualized and measured as latent factors that transcend their specific indicators and represent shared etiologic processes conferring a vulnerability to a broad range of psychopathology.

## Factors of Psychopathy and Relations with Externalizing Criteria: The Impact of Method Variance

Indicators of EXT are among the most highly investigated criteria of psychopathy. The bulk of this research has been conducted with the PCL-R – a 20-item rating scale that is scored based on review of institutional file data and a semi-structured interview and is designed for use within forensic settings. Although the appropriate model for conceptualizing the item structure of the PCL-R remains a matter of debate, the traditional perspective is that its item content reflects at least two broad factors, which are commonly measured in psychopathy research (Harpur et al., 1989).<sup>1</sup> PCL-R Factor 1 (F1) comprises affective-interpersonal features from the seminal clinical literature (e.g., superficial charm, egocentricity, manipulativeness, shallow affect). PCL-R Factor 2 (F2) encompasses items reflecting a deviant lifestyle and overt criminality (e.g., poor behavioral controls, impulsivity, irresponsibility, juvenile delinquency).

Although moderately correlated ( $\sim .50$ ), PCL-R factor scores exhibit distinct relations with EXT criteria. Specifically, F2 shows robust positive associations with symptoms of conduct disorder and adult antisocial behavior (Hare, 2003; Hart & Hare, 1989), alcohol and drug abuse/dependence (Reardon, Lang, & Patrick, 2002; Smith & Newman, 1990) and violence (Skeem & Mulvey, 2001), whereas F1 exhibits only modest associations with these variables. A similar divergence has been observed for personality traits, with F2 correlating selectively with self-report measures of disinhibition (e.g., low constraint, low conscientiousness, high sensation-seeking; Hare, 2003; Harpur et al., 1989, Patrick, 1994, Verona, Patrick, & Joiner, 2001; Lynam & Derefinko, 2006). Notably, controlling for the shared variance across the PCL-R factors, associations with EXT criteria can be explained entirely by F2. In accordance with this research, Patrick et al. (2005) explored structural relations between the PCL-R factors and a latent EXT factor defined by symptoms of child and adult antisocial behavior and substance dependence. In contrast with F1, which exhibited a non-significant negative correlation with EXT after controlling for F2 scores, the unique variance in F2 was highly correlated with the latent EXT factor ( $r = .94$ ).

Similar findings have also been reported between EXT and psychopathy as measured by scores on the PPI. This self-report measure was designed to capture personality constructs of psychopathy from early clinical conceptions and, in contrast to the PCL-R, does not explicitly

<sup>1</sup>Alternative three- and four-factor models have been proposed for the PCL-R. In the three-factor model (Cooke & Michie, 2001), PCL-R F1 is parsed into one factor comprising items reflecting an “arrogant and deceitful interpersonal style” and another factor consisting of items reflecting “deficient affective experience.” The third factor (i.e., impulsive and irresponsible behavioral style) represents the social deviance component of the PCL-R in terms of 5 of the 9 items from the original PCL-R F2. The remaining PCL-R items, which are explicit indicators of antisocial behavior, were omitted from the three-factor model. These items are included as a distinctive “Antisocial” facet in Hare’s (2003) four-factor model of the PCL-R, which also includes “Interpersonal,” “Affective,” and “Lifestyle” facets consisting of items equivalent to the factors of Cooke and Michie’s (2001) model. Analyses in the current study focused on scores for PCL-R F1 and F2 because these broad factors have been the focus of most prior research on relations between the PCL-R and psychopathological criteria, and their convergent and discriminant validity in this arena is well documented.

reference criminal behavior. Evidence has accumulated that a largely orthogonal two-factor structure, conceptually similar to the two-factor model of the PCL-R, underlies the PPI's subscales (Benning, Patrick, Hicks, Blonigen, & Krueger, 2003; Patrick, Edens, Poythress, Lilienfeld, & Benning, 2006; Wilson, Frick, & Clements, 1999; Witt, Donnellan, Blonigen, Krueger, & Conger, 2009; but see Neumann, Malterer, & Newman, 2008).<sup>2</sup> PPI-1 ("Fearless Dominance," Benning, Patrick, Blonigen, Hicks, & Iacono, 2005a) is marked by traits of dominance, narcissism, stress immunity, and fearlessness – core features of the affective-interpersonal factor of psychopathy. PPI-2 ("Impulsive Antisociality," Benning et al., 2005a) comprises traits of impulsivity, aggression, and alienation – analogous to the social deviance factor of psychopathy. Validity studies indicate that scores on the PPI factors, computed either directly from the PPI or estimated from the Multidimensional Personality Questionnaire (MPQ; Patrick, Curtin, & Tellegen, 2002), yield associations with EXT comparable to the PCL-R factors (Benning et al., 2003, 2005a; Edens, Poythress, Lilienfeld, Patrick, & Test, 2008; Patrick et al., 2006; Poythress et al., 2009). For example, PPI-2 is positively related to child and adult antisocial behavior, substance abuse/dependence, and disinhibitory personality traits, whereas PPI-1 exhibits negligible to modest associations with these criteria (Benning et al., 2003, 2005a; Blonigen, Hicks, Krueger, Patrick, & Iacono, 2005; Patrick et al., 2006).

Despite similarity in these patterns of associations, it is notable that the magnitude of the validity coefficients for the PPI in relation to EXT criteria are modest relative to the PCL-R, thus raising concerns about the extent to which scores on the PPI are associated with indices of deviant behaviors. For example, studies have reported higher correlations between PCL-R scores and symptoms of conduct disorder, antisocial personality disorder, and substance abuse/dependence (e.g., Hare, 2003) than those reported for the PPI (Blonigen et al., 2005; Benning et al., 2005a). However, an important issue noted long ago by Campbell and Fiske (1959) – yet often overlooked in the psychopathy literature – is that evaluation of the validity of scores on psychological measures must account for the impact of method variance that is shared (or unshared) across predictors and criteria. From this perspective, PCL-R scores would be expected to be more highly predictive of interview-based assessments of EXT, whereas PPI scores are likely to converge more strongly with self-report assessments of EXT. The impact of method variance is likely applicable to a range of external criteria beyond EXT and warrants greater consideration when evaluating the criterion and construct validity of psychopathy measures. To this end, our analyses used available criterion indicators of self-report and interview-based measures of EXT to evaluate correspondence with psychopathy scores derived from the same versus different measurement domains.

## Factors of Psychopathy and Relations with Internalizing Criteria: The Role of Suppressor Effects

Links between psychopathy and low INT distress are discussed prominently among early clinical conceptualizations of the syndrome. For example, Cleckley (1941) contended that psychopathy was marked by a diminished capacity for emotional distress as manifested by an absence of nervousness or other psychoneurotic manifestations and low incidence of suicide

<sup>2</sup>Like the question of the PCL-R item structure, the issue of the best-fitting structural model of the PPI subscales remains a topic of some debate. Although the PPI two-factor model has been replicated in exploratory factor analyses with different samples (Benning et al., 2003; Benning, Patrick, Salekin, & Leistico, 2005b; Ross, Benning, Patrick, Thompson, & Thurston, 2009), Neumann et al. (2008) recently reported that the PPI two-factor model achieved less than adequate fit when evaluated using confirmatory factor analytic (CFA) criteria. However, concerns have been raised in the literature that CFA may be overly conservative as a method for evaluating the fit of structural models of personality inventory data (Church & Burke, 1994; McCrae, Zonderman, Costa, Bond, & Paunonen, 1996). Relatedly, the point has been made that the ability of a model to organize relations among constructs is important to consider along with issues of statistical goodness-of-fit (Westen & Rosenthal, 2003). As with the two factors of the PCL-R, an extensive evidence base now exists to support the PPI factors as meaningful and distinct measures (Benning et al., 2003, 2005a, 2005b; Blonigen et al., 2005; Douglas et al., 2008; Edens et al., 2008; Patrick et al., 2006; Poythress et al., 2009; Ross et al., 2009; Sellbom, Ben-Porath, Lilienfeld, Patrick, & Graham, 2005; Uzieblo et al., 2007; Witt et al., 2009).

—suggesting resilience to disorders of anxiety or depression. Moreover, Karpman (1941) identified a subtype of “primary” psychopathy marked by reduced anxiety and emotional distress, and Lykken (1957, 1995) proposed low fear as representing the etiologic core of primary psychopathy. Psychophysiological research provides support for this view, including evidence that individuals with high levels of psychopathic features show attenuated fear-potentiated startle and diminished autonomic reactivity to threatening stimuli (Levenston, Patrick, Bradley, & Lang, 2000; Patrick, Bradley, & Lang, 1993; Vanman, Mejia, Dawson, Schell, & Raine, 2003; Verona, Patrick, Curtin, Bradley, & Lang, 2004).

In terms of the psychometric evidence, findings to date on the link between psychopathy and low INT have been mixed. In contrast to traditional clinical conceptions, PCL-R total scores exhibit null, or in some cases modest positive, associations with measures of INT (Hare, 2003; Schmitt & Newman, 1999). At the factor level, some studies have reported negative correlations between F1 scores and indicators of INT (e.g., anxiety, self-criticism; Harpur et al., 1989), whereas others have reported null associations (Vitale, Smith, Brinkley, & Newman, 2002; Schmitt & Newman, 1999). Similar ambiguity is evident for F2, with several studies reporting modest, positive correlations with measures of negative affect (Hale, Goldstein, Abramowitz, Calamari, & Kosson, 2004; Shine & Hobson, 1997; Vitale et al., 2002) and others reporting no relationship (Harpur et al., 1989; Schmitt & Newman, 1999).

In contrast with most published research, which has reported only zero-order correlations, studies controlling for the shared variance between the PCL-R factors using partial correlation or regression methods reveal divergent relations with INT. That is, scores on F1 and F2 exhibit negative and positive associations, respectively, with INT criteria including stress reaction, negative affectivity, and suicide attempts (Douglas et al., 2008; Patrick, 1994; Verona et al., 2001, 2005). Such findings suggest the presence of *suppressor effects* in the association between PCL-R psychopathy scores and INT, specifically cooperative suppression. Cooperative suppression occurs when two correlated predictors evince opposing relations with a given criterion, such that inclusion of both concurrently in a regression model increases the predictive weight of each with the criterion (Paulhus, Robins, Trzesniewski, & Tracy, 2004). In statistical terms, first-order (beta) coefficients reflecting unique associations for each predictor with the criterion are greater than their zero-order correlations due to the fact that variance shared with the other predictor is not predictive in the same way, thereby suppressing the association.

In an analysis of relations between the PCL-R factors and facets of NEM (i.e., distress, fearfulness, anger-hostility), Hicks and Patrick (2006) reported evidence of cooperative suppression such that the magnitude of the associations for both F1 and F2 with the NEM facets increased when the two were entered together rather than individually in prediction models. For the PPI, parallel divergences in associations with INT are evident at the zero-order level for the factors of this measure, which are largely independent of one another: PPI-1 is inversely related to self- and parental reports of trait anxiety, distress, fear, symptoms of depression and anxiety, and suicide-related behavior; PPI-2 is positively correlated with these criteria (Benning et al., 2003, 2005a; Blonigen et al., 2005; Douglas et al., 2008; Patrick et al., 2006; Uzieblo, Verschuere, & Crombez, 2007; Witt et al., 2009).

If replicable, suppressor effects have important implications for the assessment of psychopathy. Most notably, cooperative suppression suggests that multifaceted constructs embedded within a single instrument that have opposing relations to clinically relevant criteria should be assessed separately from one another to increase their predictive associations with such criteria. In this respect, the PCL-R, although designed as a unitary measure, may exhibit greater predictive power for INT-relevant outcomes (e.g., suicide) when its factors are considered in isolation from one another. By implication, the PPI may be better suited to the prediction of INT-relevant



criteria given that its factors are largely orthogonal rather than moderately correlated as in the PCL-R. Despite these potential implications, suppressor effects have been criticized as being inconsistent, sample-specific, and rarely replicable (Maasen & Baker, 2001; Wiggins, 1973). Hence, further demonstration of their presence in psychopathy measures, particularly in relation to a range of INT criteria, is needed.

## Current Study

The current study investigated patterns of convergence and divergence with INT and EXT using a multi-method assessment of psychopathy. Relations for psychopathy factor scores were examined in terms of both zero- and first-order associations to test for the presence of suppressor effects on these associations. We predicted that PPI-1 and PCL-R F1 would exhibit weak or negligible associations with EXT, and negative associations with INT that would become larger after controlling for (in the case of the PCL-R) shared variance across the psychopathy factors. In contrast, PPI-2 and PCL-R F2 were predicted to correlate positively with both EXT and INT. From an assessment standpoint, the present design represents a notable extension to the existing literature as it includes multiple assessments of psychopathy in relation to *both* INT and EXT criteria in the same design, thus permitting evaluation of the impact of method variance on associations between psychopathy and external criteria. To date, no studies have examined relations between psychopathy and INT and EXT across multiple assessment domains.

## Method

### Participants

Participants included offenders (prisoners as well as individuals drawn from court-ordered substance use treatment programs) in Florida, Nevada, Oregon, Texas, and Utah. Four of the five treatment programs were community-based, whereas one (Texas) was located within a prison. To mitigate the impact of major mental illness on protocol responses, participants were excluded if they were currently receiving psychotropic medications for active symptoms of psychosis or resided in a mental health unit in prison. Incarcerated participants were deemed eligible if they spoke fluent English and had an estimated IQ  $\geq 70$  on the Quick Test, a brief screen of intellectual functioning (Ammons & Ammons, 1962). Individuals from substance use treatment programs were required to have completed all detoxification procedures prior to recruitment. At each site, participants were randomly recruited from lists of individuals who met the inclusion criteria. After obtaining informed consent, screening measures for IQ and reading ability were administered followed by the research protocol for eligible participants.

A total of 1,741 participants were enrolled in the study: 1,413 men (81.2%), 299 women (17.2%), and 29 individuals (1.7%) with missing gender data. The self-reported ethnic and racial composition of the sample was as follows: 1,079 Caucasians (62.0%), 595 African Americans (34.2%), and 67 participants (3.8%) with missing race data. In terms of recruitment site, 911 participants were drawn from prisons (52.3%) and 830 from substance use treatment programs (47.7%).<sup>3</sup> The present analyses were based on 1,701 eligible participants with available data on either psychopathy or the INT and EXT criterion measures. The mean age across these participants at time of assessment was 31.04 years ( $SD = 6.60$ , Range = 17.96 – 59.37).

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<sup>3</sup>Supplementary analyses performed separately for criminal offenders and court-referred substance users yielded a pattern of findings in both sub-samples that was comparable to the overall sample.

## Assessment

**PCL-R**—Scores on the PCL-R were based on a semi-structured interview and review of collateral file information to provide ratings on 20 items. The psychometric properties of the PCL-R have been previously described and include excellent interrater reliability for scores on the PCL-R in research settings (Hare, 2003). PCL-R data were available for 1,572 individuals. Interview protocols were administered by research assistants who received extensive training on the measure, including 2.5 days of face-to-face training from an expert on the PCL-R (Stephen Hart). Prior to the onset of data collection, research assistants completed 10 training tapes and were required to obtain an intraclass correlation ( $ICC_1$ ) of  $\geq .80$  with criterion ratings. To reduce rater drift, the project coordinator conducted regular site visits over the course of the study to observe PCL-R interviews and independently score interview protocols. For the present sample, interrater reliability analyses for PCL-R total scores, based on 51 cases derived from these site visits, yielded an intraclass correlation coefficient ( $ICC_1$ ; absolute agreement definition; two-way mixed random [raters]/fixed [scale] model) of .88. Scores on PCL-R F1 and F2 were computed by summing scores for items associated with each factor (Hare, 2003). In the current sample, the correlation between scores on PCL-R F1 and F2 was .50.

**PPI**—Self-report scores on psychopathy were assessed with the PPI, which consists of 187 items, endorsed on a 4-point Likert scale (1 = *False*, 2 = *Mostly False*, 3 = *Mostly True*, 4 = *True*). The inventory provides a total score as well as scores on 8 subscales, which yielded the following internal consistency estimates (Cronbach's alphas): Machiavellian Egocentricity = .89, Social Potency = .86, Fearlessness = .85, Coldheartedness = .78, Impulsive Nonconformity = .73, Blame Externalization (formerly called Alienation) = .87, Carefree Nonplanfulness = .84, Stress Immunity = .80). Satisfactory internal consistency has also been reported for PPI total and scale scores in undergraduate (Lilienfeld & Andrews, 1996), community (Blonigen, Carlson, Krueger, & Patrick, 2003), and offender samples (Neumann et al., 2008; Sandoval, Hancock, Poythress, Edens, & Lilienfeld, 2000; Uzieblo et al., 2007). PPI data were available for 1,607 participants.

Seven of the eight PPI subscales typically cohere into two largely orthogonal factors (PPI-1 & PPI-2; Benning et al., 2003, Patrick et al., 2006; Witt et al., 2009). Scores for PPI-1 were computed by taking the average of the summed  $z$ -scores of Social Potency, Fearlessness, and Stress Immunity (Benning et al., 2003). Scores for PPI-2 were computed by taking the average of the summed  $z$ -scores of Machiavellian Egocentricity, Impulsive Nonconformity, Blame Externalization, and Carefree Nonplanfulness. The PPI Coldheartedness scale does not load highly on either PPI factor and was therefore excluded from these computations. Scores on the two factors of the PPI were correlated to a negligible, albeit statistically significant, degree in our large sample ( $r = -.06$ ;  $p = .013$ ).

In the current sample, the zero-order correlation between total scores on the PPI and the PCL-R was .43 ( $p < .01$ ). With regard to corresponding factors of the two instruments, PPI-1 was correlated more strongly with PCL-R F1 than with F2 ( $r_s = .26$  and  $.16$ , respectively,  $p_s < .01$ ), whereas PPI-2 was correlated more highly with PCL-R F2 than F1 ( $r_s = .38$  and  $.17$ , respectively,  $p_s < .01$ ). When examining partial correlations to control for the shared variance between the PCL-R factors, PPI-1 was selectively associated with PCL-R F1 (partial  $r = .21$ ,  $p < .01$ ) and unrelated to PCL-R F2 (partial  $r = .04$ ,  $ns$ ), whereas PPI-2 was preferentially related to PCL-R F2 (partial  $r = .35$ ,  $p < .01$ ) and unrelated with PCL-R F1 (partial  $r = -.03$ ,  $ns$ ).

**Self-Report Measures of Internalizing & Externalizing**—The PAI, a 344 item self-report inventory of personality and psychopathology, was used to measure factor scores of INT



and EXT. The PAI consists of 11 clinical scales, 5 treatment consideration scales, 2 scales of interpersonal style, and 4 validity scales. The scales of primary interest in this study included the clinical scales of Anxiety (ANX;  $\alpha = .91$ ), Anxiety-Related Disorders (ARD;  $\alpha = .81$ ), Depression (DEP;  $\alpha = .89$ ), Antisocial Features (ANT;  $\alpha = .85$ ), Alcohol Problems (ALC;  $\alpha = .94$ ), Drug Problems (DRG;  $\alpha = .89$ ), and the treatment consideration scale of Aggression (AGG;  $\alpha = .91$ ). Numerous studies, including research conducted with criminal offenders, support the construct validity of each of these scales (e.g., Edens & Ruiz, 2008). These scales were chosen *a priori* based on the following criteria: (a) they represent specific indicators of either INT or EXT according to the literature on the structure of psychopathology (Krueger, 1999, Vollebergh et al., 2001), and (b) they loaded strongly on these dimensions in a recent analysis of PAI scales in offender samples (Ruiz & Edens, 2008). The PAI is appealing for use in forensic and correctional settings due to its relatively low reading level (4<sup>th</sup> grade), brevity, solid psychometric properties (Morey, 2007; Edens & Ruiz, 2005), and multiple validity scales. Results herein include PAI data for 1,642 participants including 39 participants whose scores on the validity scales exceeded cutoffs recommended by Edens and Ruiz (2005) as indicating potentially invalid profiles (i.e., Inconsistency >79 or Infrequency >79). These participants were included in the final analyses as the results did not differ as a function of whether these subjects were included versus excluded. The distributions of several PAI scales were somewhat skewed in the present data. Thus, scale scores were transformed using Blom's rank transformation method to normalize the distributions (Blom, 1958).

**Interview Measures of Externalizing**—Diagnostic symptom counts of conduct disorder (CD;  $n = 1,515$ ) and adult antisocial behavior (AAB;  $n = 1,543$ ) were obtained using the Antisocial Personality Disorder (ASPD) module of the Structured Clinical Interview for DSM-IV Axis-II Personality Disorders (SCID-II; First, Gibbon, Spitzer, Williams & Benjamin, 1996). This module, based on DSM-IV criteria, yields dimensional and categorical (diagnostic) scores for both CD and ASPD. In this study, the interrater reliability was high for both diagnoses of ASPD ( $\kappa = .74$ ;  $n = 50$ ) and total symptom count (ICC = .86;  $n = 46$ ), along with similarly high internal consistency ( $\alpha = .83$ ).

## Data Analysis

Confirmatory factor analysis (CFA) was used to test the fit of a two-factor model of INT and EXT with ANX, ARD, and DEP selected as indicators of INT, and ANT, AGG, DRG, and ALC chosen to estimate EXT. This analysis was conducted with the raw (Blom-transformed) data using maximum likelihood estimation, which accounts for missing data, in the statistical package *Mplus* 4.1 (Muthén & Muthén, 1998 – 2006). Evaluation of model fit was based on the chi-square fit statistic ( $\chi^2$ ), the comparative fit index (CFI), the Tucker-Lewis Index (TLI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR). Chi-square and RMSEA yield overall estimates of model fit, with RMSEA providing an index of the discrepancy in model fit per degree of freedom. SRMR provides an estimate of the average discrepancy between the observed and model-estimated sample statistics. For CFI and TLI, values approaching 1.0 indicate a good fitting model with values ranging from .90 – .95 suggesting acceptable fit (Brown, 2006). For RMSEA and SRMR, values less than .08 indicate an acceptable fit to the data (Brown, 2006), whereas values less than .06 suggest a “close” fit to the data (Hu & Bentler, 1999).

To investigate relations between self-report (PPI) and interview and file review-based (PCL-R) assessments of psychopathy and INT and EXT, we began with a structural model in which INT and EXT were modeled as latent (correlated) criterion variables with psychopathy scores included as predictors in the model. PPI and PCL-R total and factor scores were modeled as manifest variables and were entered individually as predictors to assess zero-order associations with the latent criteria. For the PCL-R, scores for the two factors were entered jointly into the

model to assess the unique relations between each factor and INT and EXT after controlling for shared variance with the other factor. To evaluate the significance of suppressor effects, the Sobel test statistic ( $z$ ) was calculated using a publicly available macro (<http://people.ku.edu/~preacher/sobel/sobel.htm>). This test, commonly used in the intervening variable framework of mediation models, provides an index of the significance of the change in the beta coefficient for a predictor variable after entry of a second predictor into the model. Changes in the squared multiple correlation ( $\Delta R^2$ ) were used to evaluate the incremental validity of scores on each PCL-R factor over the other in the prediction of the criterion variables.

Our approach of measuring psychopathy at the manifest level is consistent with Hicks and Patrick (2006) in their examination of associations between the PCL-R and latent indices of NEM. Moreover, adjudicating among the best-fitting structural model of the PPI and PCL-R – issues of ongoing debate in the literature – is beyond the scope of the current study. By contrast, there is general consensus among scholars that INT and EXT represent latent dimensions of psychopathology that transcend their specific indicators. Thus, we chose to derive INT and EXT at the latent level to obtain indices of these criteria that are equivalent to their conceptualization and measurement in extant research.

Following the SEM analyses, we evaluated the impact of measurement domain on the magnitude of associations between measures of psychopathy and external criteria. Using self-report and interview composites of EXT, we compared zero- and first-order relations with the self-report (PPI) and interview/file review-based measures of psychopathy (PCL-R). In contrast to the range of EXT indicators available in self-report PAI, these analyses were limited to antisocial indicators of EXT as the interview-based (SCID) counterparts were not available for either substance abuse indicators of EXT or for any indicators of INT.

## Results

### Derivation of Latent Internalizing and Externalizing Criteria

A correlated two-factor model was fit to the PAI scales using CFA with INT measured by ANX, ARD, and DEP, and EXT measured by ANT, AGG, DRG, and ALC. This model yielded the following fit indices:  $\chi^2$  (df) = 375.19 (13),  $p < .01$ ; CFI = .92; TLI = .87; RMSEA = .130; SRMR = .060. Although CFI and SRMR suggested adequate fit, RMSEA indicated marginal fit. A revised model was tested that expanded the two-factor model to include correlated residual terms for pairs of conceptually related indicators of EXT (i.e., ANT & AGG; DRG & ALC). The coherence between these indicator pairs is consistent with recent factor analytic work demonstrating distinct aggression and substance use subfactors in conjunction with an overarching EXT factor (Krueger et al., 2007). This revised model provided a good overall fit to the data [ $\chi^2$  (df) = 123.64 (11),  $p < .01$ ; CFI = .98; TLI = .95; RMSEA = .079; SRMR = .040] and a significant improvement in fit compared with the two-factor model without correlated residuals:  $\Delta\chi^2$  (2) = 251.55,  $p < .01$ . By contrast, inclusion of correlated residuals for indicators of INT attenuated rather than improved the fit of the model.<sup>4</sup> Figure 1 shows the parameter estimates for the correlated two-factor model.

### Structural Relations between Psychopathy Factors and Internalizing and Externalizing

Parameter estimates of relations between the psychopathy factors and INT and EXT criteria are provided in Table 1. Ranges for the fit statistics from these models were as follows: CFI = .94-.95, TLI = .90-.91, RMSEA = .09-.11, SRMR = .049-.066.<sup>5</sup> For INT, a small to negligible

<sup>4</sup>To evaluate the stability of the INT/EXT model as parameterized in the main analyses, we randomly divided the overall sample in half and tested the fit of the INT-EXT model (including correlated residuals) in each sub-sample. The model fit well in both half-samples, with the magnitude of correlated residual terms similar in each model: For ANT and AGG, the magnitude of the correlated residual was .37 ( $p < .001$ ) in both sub-samples; For ALC and DRG, it was .06 in one half-sample and .08 in the other ( $ps = .056$  and  $.013$ , respectively).

association emerged between this factor and overall scores on the psychopathy inventories: PCL-R total scores were uncorrelated with INT; PPI total scores exhibited a small positive association with this criterion. For EXT, a positive association was observed for overall scores on both psychopathy measures: PPI total scores were highly correlated with EXT; PCL-R total scores were moderately correlated with this criterion.

At the level of the psychopathy factors, a divergence in associations was evident for INT versus EXT. For INT, the psychopathy factors evinced opposing associations such that PPI-1 was highly negatively related to INT, whereas PPI-2 was highly positively related to INT. A similar pattern emerged for the PCL-R: F1 was negatively correlated with INT; F2 was positively correlated with this criterion. In contrast with the PPI factors, zero-order correlations between the PCL-R factors and INT, although significant, were small in magnitude. However, when overlapping variance between the PCL-R factors was accounted for in the model, the opposing associations with INT increased in magnitude, thus demonstrating cooperative suppression (such analyses were not conducted with the PPI because its factors share almost no variance with one another). Based on the Sobel test, significant increases were observed in the associations with INT for both PCL-R F1 ( $z = 6.06, p < .01$ ) and F2 ( $z = -6.44, p < .01$ ) after inclusion of the other factor in the model. Moreover, based on changes in  $R^2$ , both F1 ( $\Delta R^2 = .03, p < .01$ ) and F2 ( $\Delta R^2 = .03, p < .01$ ) demonstrated incremental validity over the other in the prediction of INT.

For EXT, a different pattern emerged relative to INT. PPI-2 was highly correlated with EXT, whereas PPI-1 was only weakly, albeit significantly, related to this criterion. For the PCL-R, F2 also showed a moderate positive association with EXT in terms of both zero-order and first-order coefficients, whereas zero-order and first-order coefficients for PCL-R F1 were negligible and modestly negative, respectively. Sobel tests indicated a significant decrease in the association with EXT for PCL-R F1 ( $z = 13.13, p < .01$ ) and a significant increase in the association with EXT for PCL-R F2 ( $z = -3.39, p < .01$ ) after inclusion of the other factor in the model. In addition, the change in  $R^2$  was significant for both PCL-R factors when included as predictors of EXT; however, the magnitude of incremental prediction was substantially larger for F2 ( $\Delta R^2 = .26, p < .01$ ) than F1 ( $\Delta R^2 = .01, p < .01$ ).<sup>6</sup>

### Relations between Psychopathy Factors and Externalizing by Measurement Domain

A comparison of effects for the PPI versus the PCL-R in Table 1 reveals that correlations for the PPI factors with INT and EXT were markedly higher than the corresponding correlations for the PCL-R factors. This difference is potentially explainable by the fact that scores for the PPI were derived from the same measurement domain as the PAI, whereas scores for the PCL-

<sup>5</sup>As emphasized by Marsh, Hau, and Wen (2004), the stringent cutoff values for goodness-of-fit (GOF) indices proposed by Hu and Bentler (1999) are more effective at identifying model misspecification based on differences in nested models, and cautioned that these values should be viewed as “rules of thumb” rather than “golden rules.” Furthermore, as argued by Westen and Rosenthal (2003) as well as Marsh and colleagues (2004), statistical GOF is merely one criterion from which to evaluate the appropriateness of a given structural model. From this perspective, although some of the fit statistics from the structural models of INT and EXT that included the psychopathy factors as predictors were marginal by the Hu and Bentler (1999) standards, the model estimates were comparable when modeling INT and EXT as observed scales, and were highly consistent with past research.

<sup>6</sup>We supplemented the analyses of relations between PCL-R psychopathy and INT and EXT in Table 1 by parsing each of the PCL-R factors into narrower facet scores based on Hare’s (2003) 4-factor model, which encompasses the three factors in Cooke & Michie’s (2001) model. Zero-order coefficients were computed, along with first-order coefficients in which the unique predictive association for each PCL-R facet (F1: Interpersonal, Affective; F2: Lifestyle, Antisocial) was examined after controlling for variance associated with the complementary factor (F1 or F2). These analyses revealed that (1) the negative association of PCL-R F1 with INT (revealed most clearly after variance associated with F2 was controlled for) was attributable to both its Interpersonal and Affective facets; (2) the positive association of PCL-R F2 with INT (most evident after controlling for variance associated with F1) was attributable to its Lifestyle facet; (3) the positive association of F2 with EXT (robust across the zero- and first-order coefficients) was attributable to both its Lifestyle and Antisocial facets; and (4) the small negative association of F1 with EXT (evident *only* in the beta coefficient after variance associated with F2 was controlled for) was attributable to its Affective facet (cf. Poythress, Dembo, Wareham, & Greenbaum, 2006). Further details of these analyses are available from the first author upon request.

R were derived from a different measurement domain. Table 2 addresses this issue by comparing correlations for the PPI and PCL-R with EXT composite scores derived from self-report indicators (i.e., PAI ANT and AGG scales) versus interview indicators (i.e., child and adult symptoms of ASPD assessed using the SCID). EXT composite scores were computed as the average of standardized ( $z$ ) scores for indicators from one or the other assessment domain. For both the PCL-R and PPI, correlations with EXT were uniformly higher when assessed within the same measurement domain: PPI scores, particularly total scores and PPI-2, exhibited significantly higher correlations with the *self-report* EXT composite than with the interview-based EXT composite; PCL-R total and factor scores demonstrated significantly larger correlations with the *interview*-based EXT composite than with the self-report EXT composite. Relative to the zero-order coefficients, the first-order coefficients showed a similar pattern of method convergence. With the exception of PPI-1, all parameter estimates were significantly different across measurement domains within each predictor. Notably, the magnitude of association for scores on the two psychopathy instruments with EXT was highly comparable when EXT scores were derived from the same measurement domain, and when shared variance between the PCL-R factors was removed. When the self-report and interview composite scores were combined into a single index of EXT (i.e., mean of the composites), scores on this combined composite were also correlated with PCL-R F2 ( $r = .65, \beta = .63$ ) and PPI-2 ( $r = .65$ ) to a comparably high level.<sup>7</sup>

For the self-report EXT composite, Sobel tests indicated a significant decrease in the association with this criterion for PCL-R F1 ( $z = 14.07, p < .01; \Delta R^2 = .17, p < .01$ ) and a nonsignificant change in the relationship with this criterion for PCL-R F2 ( $z = -1.50, ns; \Delta R^2 = .001, ns$ ) after inclusion of the other factor in the model. For the interview-based EXT composite, Sobel tests indicated a significant decrease in the relationship with this criterion for both PCL-R F1 ( $z = 17.62, p < .01$ ) and PCL-R F2 ( $z = 5.34, p < .01$ ). Consistent with findings presented in Table 1, the magnitude of incremental prediction for this criterion was substantially larger for F2 ( $\Delta R^2 = .32, p < .01$ ) than F1 ( $\Delta R^2 = .01, p < .01$ ).

## Discussion

The current study investigated the impact of method variance and suppressor effects in the relationship between factors of psychopathy and INT and EXT criteria operationalized via latent variables. Consistent with prior research, scores on the affective-interpersonal factor of psychopathy (PCL-R F1, PPI-1) were negatively associated with INT, whereas scores on the social deviance factor (PCL-R F2, PPI-2) were positively associated with INT. In the case of the PCL-R, clear evidence of cooperative suppression was obtained such that associations with INT increased significantly when both factors were included concurrently as predictors of this criterion compared to when either was considered alone as a predictor. This replicates prior work demonstrating suppressor effects in correlations for the PCL-R factors (or factors of cognate psychopathy measures) with measures of negative affect (Frick et al., 1999, 2000; Hicks & Patrick, 2006; McHoskey, Worzel, & Szyarto, 1998) and suicidal tendencies (Douglas et al., 2008; Verona et al., 2005). With respect to EXT, scores for both PCL-R F2 and PPI-2 were positively correlated with this criterion, adding to a growing body of data establishing a close correspondence between the social deviance factor of psychopathy and disinhibitory psychopathology (Blonigen et al., 2005; Patrick et al., 2005; Smith & Newman, 1990).

<sup>7</sup>A potential alternative interpretation is that divergence in the correlations for same versus different measurement domains could have reflected differences in the constructs assessed rather than the domain in which they were measured. That is, self-report indicators of EXT (PAI-based ANT and AGG) may have indexed a different construct than the interview-based indicators (SCID-based CD and AAB). One piece of evidence arguing against this possibility is that the correlation between the self-report and interview-based EXT composites ( $r = .53$ ) was comparable to the correlations between indicators within each measurement domain (i.e., CD and AAB were correlated .48; ANT and AGG were correlated .61).

## Moderating Impact of Method Variance: Implications for Evaluating the Validity of Psychopathy Measures

Method variance is a crucial issue that tends to be overlooked in studies evaluating the criterion and construct validity of psychopathy measures. In their classic paper, Campbell and Fiske (1959) pointed out that compared with measures of the same construct assessed within the *same* methodological domain, which are expected to show high correlations with one another (.7 – .9), alternative measures of the same construct assessed in *different* methodological domains are expected to show only moderate levels of association (.4 – .6). Indeed, the current finding that the level of association with the self-report criterion variables for the PCL-R factors was lower than that for the corresponding PPI factors highlights the importance of method variance as a moderator of relations between psychopathy factors and external criteria.

The present work addressed this issue by comparing the relative strength of associations for scores on the PCL-R versus the PPI with composite scores of EXT based on interview and self-report indicators. As predicted, the magnitude of the associations was comparably high for the two instruments when the predictor and criterion were assessed in the same measurement domain, and comparably moderate when the predictor and criterion were assessed in different domains. Remarkably, when derived from the same measurement domain and when the shared variance between the PCL-R factors is controlled for, the magnitude of the associations with EXT for the two psychopathy measures were nearly identical (i.e., zero-order coefficients for PPI-1 and PPI-2 with self-report based EXT were .15 and .69, respectively; first-order coefficients for PCL-R F1 and F2 with interview-based EXT were .11 and .65, respectively). These results can be tied to findings from existing published work revealing stronger associations with clinical ratings of ASPD symptoms for the PCL-R (Hare, 2003) than the PPI (Blonigen et al., 2005; Benning et al., 2005a). Collectively, the data suggest that comparisons of the validity of interpretations based on self-report and interview-based measures of psychopathy can be facilitated by combining measures from different assessment domains into composite criterion variables (see Hare & Cox, 1978).

An additional benefit of our multi-method approach to psychopathy assessment is that it helped to clarify the degree of correspondence between the constructs underlying factors of psychopathy measures and criteria of INT and EXT. For example, in contrast to past findings revealing moderate correlations between scores on PPI-2 and interview-based symptoms of EXT (Blonigen et al., 2005), the present observation of a strong overlap between scores on PPI-2 and PAI-based EXT is consistent with the notion that these two variables represent alternative measures of the same construct within the same measurement domain. In conjunction with other work demonstrating high correspondence between PCL-R F2 and EXT when scores on the latter incorporate interview measures (Patrick et al., 2005), the current findings suggest that PCL-R F2 and PPI-2 are measuring nearly equivalent constructs within different domains of assessment. By implication, the modest intercorrelations previously reported between these corresponding factors of the PPI and PCL-R may be due, in part, to the influence of method variance.

Although the current study did not include interview-based indicators of INT, by extension it can be hypothesized that differences in the strength of the negative associations with INT for PCL-R F1 ( $r/\beta = -.12/-.21$ ) versus PPI-1 ( $r = -.51$ ) is at least partially attributable to method variance. Consistent with this interpretation, Blonigen et al. (2005) reported significant correlations between MPQ-estimated PPI-1 scores and interview-based symptoms of INT (i.e.,  $-.26$  and  $-.25$  for women and men, respectively). These correlations were lower than the correlation between INT and PPI-1 in the current study, but comparable to the association between INT and the unique variance in PCL-R F1. Thus, the negative association between PCL-R F1 and scores on INT would likely be amplified for a composite that incorporated interview-based indicators of this criterion.



However, the fact that the negative relationship between PAI-based INT and PPI-1 was moderate rather than high in magnitude indicates that these two variables are predicting *related* rather than equivalent constructs. Furthermore, across the PPI and PCL-R, the strength of the positive association between scores on the social deviance factors of these measures and EXT exceeded the strength of the negative association between scores on the affective-interpersonal factors and INT. These differences in relative strength suggest that scores on the social deviance factors are more directly indicative of EXT tendencies than scores on the affective-interpersonal factors are of the absence of INT tendencies. In other words, the social deviance factor of psychopathy is largely synonymous with the EXT dimension of psychopathology, whereas the construct measured by scores on the affective-interpersonal factor only partly reflects resilience against INT symptomatology.

### **Moderating Impact of Suppressor Effects: Implications for Theory and Clinical Assessment**

Beyond the role of method variance, the present study elucidates another source of difference between the PPI and PCL-R in their relations with external criteria. In contrast to the factors of the PCL-R, scores on PPI-1 and 2 are largely independent. As a function of this, differential associations between the PPI factors and criterion variables are clearly revealed in simple (zero-order) correlations, whereas distinctive relations with many criterion measures for the PCL-R factors emerge more clearly when their shared variance is accounted for using regression or structural analytic techniques. The current data helps to reconcile observed differences in criterion-related validity across the PPI and PCL-R as well as disparities between theory and empirical observations for the PCL-R. Specifically, the identification of cooperative suppressor effects for the PCL-R factors in relation to INT reconciles the strong emphasis that Cleckley (1941) placed on “absence of nervousness and psychoneurotic features” with the null or slight positive association typically reported between total scores on the PCL-R and indices of anxiety and depression (Hare, 2003).

From the standpoint of clinical assessment, the presence of suppression (particularly cooperative suppression) suggests that distinguishable constructs are embedded within a putatively unitary measure. Consequently, instruments underpinned by multifaceted constructs with opposing relations to clinically relevant criteria should be assessed separately from one another to identify individuals who are high on one factor but low on the other, thereby increasing their ability to predict such criteria. In this respect, the PCL-R, although designed as a unitary measure, may have greater utility in predicting INT-relevant outcomes when its factors are measured in isolation. For example, Hicks and Patrick (2006) noted that separate measurement of the PCL-R factors could significantly improve prediction of clinical outcomes marked by negative affect (e.g., aggression, suicide, treatment responsiveness). By comparison, the PPI may be better suited to predict these criteria given that its factors are largely orthogonal and thus index distinctive components of the psychopathy construct in a more clearly differentiated way than the factors of the PCL-R. This probably reflects the fact that the PPI was developed to assess the spectrum of psychopathy-related traits without requiring that these traits cohere together as a unitary dimensional entity. In sum, from an assessment standpoint, the predictive utility of the PPI and PCL-R can be maximized via separate assessment of the factors of these measures, which in turn would serve to retain information that is obscured using total scores (Patrick et al., 2006).

### **Limitations and Future Directions**

A key limitation of the current study is that interview-based indicators of EXT were limited to CD and AAB, and interview-based indicators of INT were unavailable. This issue is readily addressable in future work by administering modules from the SCID that assess for anxiety, mood, and substance use disorders along with self-report and interview measures of psychopathy. In conjunction with parallel self-report measures of INT and EXT, this



methodological approach would provide for a complete same- versus cross-domain analysis of relations between factors of psychopathy and broad factors of psychopathology and would allow for a direct assessment of the proportion of variance among the measures that is attributable to method variance (i.e., an SEM-based multitrait-multimethod analysis).

An additional limitation was that analyses focused exclusively on data from adult offenders. Future studies are needed to extend these results to different developmental time points. For example, it has long been known that common disorders of childhood are also organized around broad INT and EXT dimensions (Achenbach & Edelbrock, 1984). Thus, relations between these psychopathological criteria and factors of psychopathy may be investigated in youth samples using inventories designed to measure psychopathic features in these populations (e.g., Andershed, Kerr, Stattin, & Levander, 2002; Frick & Hare, 2001; Lynam, 1997). Including multiple measures of psychopathy and psychopathology in alternative assessment domains (e.g., parent ratings versus self-report) at different stages of the lifespan would provide a valuable extension of the impact of method variance and suppressor effects on the magnitude of observed associations.

Finally, future efforts are needed to clarify points of convergence and divergence between alternative self-report and PCL-R-based measures of psychopathy (Poythress et al., 2009). For example, a key conclusion emerging from the current work is that although PCL-R F2 and PPI-2 measure nearly equivalent constructs, PCL-R F1 and PPI-1 index related but non-identical constructs. Research aimed at elucidating commonalities and distinctions between the affective-interpersonal factors of these two inventories (with consideration of issues of method variance and suppressor effects) stands to advance our understanding not only of what comprises each measure but also, more generally, what range of distinctive constructs comprise the syndrome of psychopathy (Patrick, Fowles, & Krueger, in press).

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## References

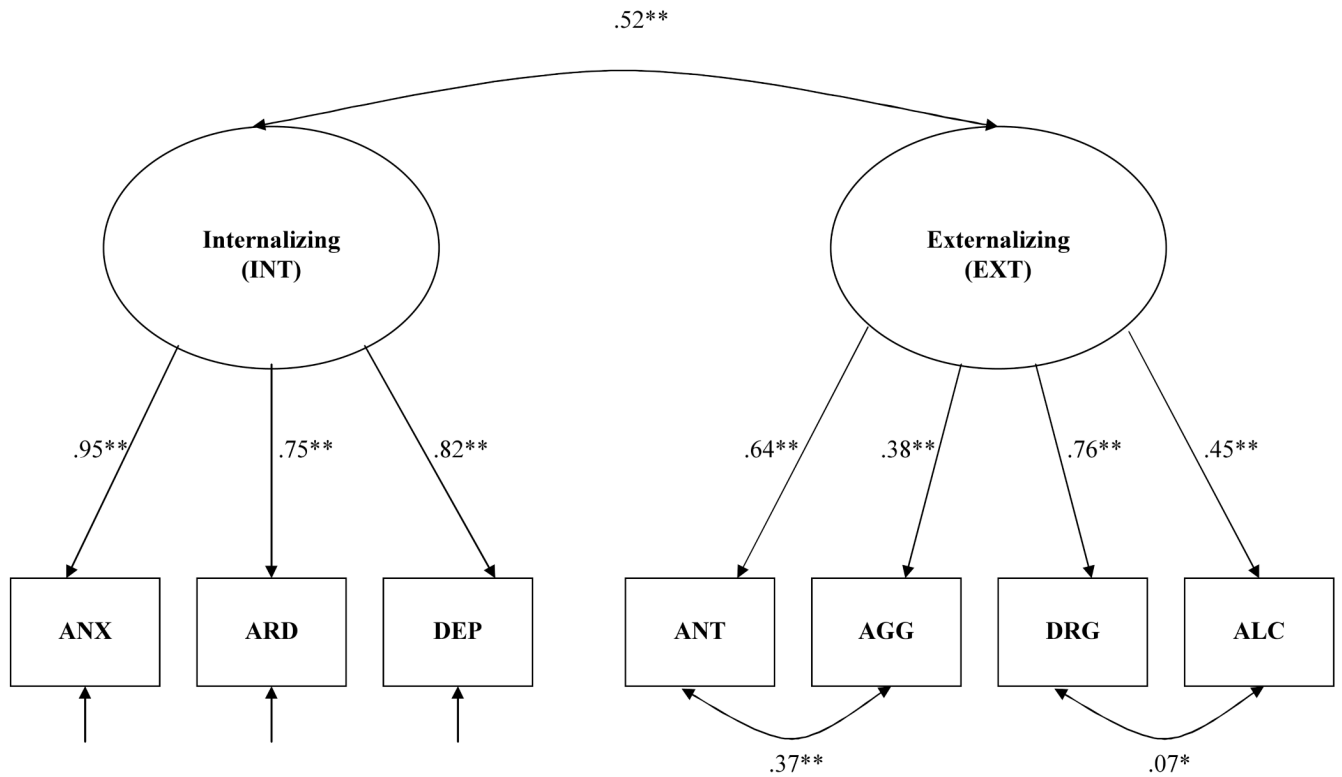
- Achenbach TM, Edelbrock CS. Psychopathology of childhood. *Annual Review of Psychology* 1984;35:227–256.
- Ammons RB, Ammons CH. The Quick Test (QT): Provisional manual. *Psychological Reports* 1962;11:111–161.
- Andershed, H.; Kerr, M.; Stattin, H.; Levander, S. Psychopathic traits in non-referred youths: Initial test of a new assessment tool. In: Blaauw, E.; Sheridan, L., editors. *Psychopaths: Current international perspectives*. The Hague: Elsevier; 2002. p. 131-158.
- Benning SD, Patrick CJ, Blonigen DM, Hicks BM, Iacono WG. Estimating facets of psychopathy from normal personality traits: A step toward community-epidemiological investigations. *Assessment* 2005a;12:3–18. [PubMed: 15695739]
- Benning SD, Patrick CJ, Hicks BM, Blonigen DM, Krueger RF. Factor structure of the Psychopathic Personality Inventory: Validity and implications for clinical assessment. *Psychological Assessment* 2003;15:340–350. [PubMed: 14593834]

- Benning SD, Patrick CJ, Salekin RT, Leistico AR. Convergent and discriminant validity of psychopathy factors assessed via self-report: A comparison of three instruments. *Assessment* 2005b;12:270–289. [PubMed: 16123248]
- Blom, G. *Statistical estimates and transformed beta variables*. New York: Wiley & Sons, Inc; 1958.
- Blonigen DM, Carlson SR, Krueger RF, Patrick CJ. A twin study of self-reported psychopathic personality traits. *Personality and Individual Differences* 2003;35:179–197.
- Blonigen DM, Hicks BM, Krueger RF, Patrick CJ, Iacono WG. Psychopathic personality traits: Heritability and genetic overlap with internalizing and externalizing psychopathology. *Psychological Medicine* 2005;35:637–648. [PubMed: 15918340]
- Brown, TA. *Confirmatory factor analysis for applied research*. New York: Guilford Press; 2006.
- Campbell DT, Fiske DW. Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin* 1959;56:81–105. [PubMed: 13634291]
- Church AT, Burke PJ. Exploratory and confirmatory tests of the Big Five and Tellegen's three- and four-dimensional models. *Journal of Personality and Social Psychology* 1994;66:93–114. [PubMed: 8126653]
- Cleckley, HM. *The mask of sanity*. St. Louis, MO: Mosby; 1941.
- Cooke DJ, Michie C. Refining the construct of psychopathy: Towards a hierarchical model. *Psychological Assessment* 2001;13:171–188. [PubMed: 11433793]
- Douglas KS, Lilienfeld SO, Skeem JL, Poythress NG, Edens JF, Patrick CJ. Relation of antisocial and psychopathic traits to suicide-related behaviors among offenders. *Law and Human Behavior* 2008;32:511–525. [PubMed: 18080733]
- Edens JF, Poythress NG, Lilienfeld SO, Patrick CJ, Test A. Further evidence of the divergent correlates of the Psychopathic Personality Inventory factors: Prediction of institutional misconduct among male prisoners. *Psychological Assessment* 2008;20:86–91. [PubMed: 18315404]
- Edens, JF.; Ruiz, MA. *Personality Assessment Inventory Interpretive Report for Correctional Settings (PAI-CS) professional manual*. Odessa, FL: PAR, Inc; 2005.
- Edens JF, Ruiz MA. Identification of mental disorders in an in-patient prison psychiatric unit: Examining the criterion-related validity of the Personality Assessment Inventory. *Psychological Services* 2008;5:108–117.
- First, MB.; Gibbon, M.; Spitzer, RL.; Williams, JBW.; Benjamin, L. *User's guide for the Structured Clinical Interview for DSM-IV Axis II Personality Disorders (SCID-II, Version 2.0, July 1996 Final Version)*. New York, NY: Biometrics Research Department, New York State Psychiatric Institute; 1996.
- Frazier TW, Naugle RI, Haggerty KA. Psychometric adequacy and comparability of the short and full forms of the Personality Assessment Inventory. *Psychological Assessment* 2006;18:324–333. [PubMed: 16953735]
- Frick, PJ.; Hare, RD. *Antisocial Process Screening Device*. Toronto, Ontario: Multi-Health Systems; 2001.
- Frick PJ, Lilienfeld SO, Edens JF, Poythress NG, Ellis M, McBurnett K. The association between anxiety and antisocial behavior. *Primary Psychiatry* 2000;7:52–57.
- Frick PJ, Lilienfeld SO, Ellis M, Loney B, Silverthorn B. The association between anxiety and psychopathy dimensions in children. *Journal of Abnormal Child Psychology* 1999;27:383–392. [PubMed: 10582839]
- Hale LR, Goldstein DS, Abramowitz CS, Calamari JE, Kosson DS. Psychopathy is related to negative affectivity but not to anxiety sensitivity. *Behaviour Research and Therapy* 2004;42:697–710. [PubMed: 15081885]
- Hare, RD. *The Hare Psychopathy Checklist-Revised*. Toronto, Ontario, Canada: Multi-Health Systems; 1991.
- Hare, RD. *The Hare Psychopathy Checklist-Revised*. 2nd. Toronto, Ontario, Canada: Multi-Health Systems; 2003.
- Hare, RD.; Cox, DN. Clinical and empirical conceptions of psychopathy, and the selection of subjects for research. In: Hare, RD.; Schalling, D., editors. *Psychopathic behaviour: Approaches to research*. Chichester, England: John Wiley & Sons, Inc; 1978. p. 1-21.

- Harpur TJ, Hare RD, Hakstian AR. Two-factor conceptualization of psychopathy: Construct validity and assessment implications. *Psychological Assessment* 1989;1:6–17.
- Hart SD, Hare RD. Discriminant validity of the Psychopathy Checklist in a forensic psychiatric population. *Psychological Assessment* 1989;1:211–218.
- Hicks BM, Patrick CJ. Psychopathy and negative emotionality: Analyses of suppressor effects reveal distinct relations with emotional distress, fearfulness, and anger-hostility. *Journal of Abnormal Psychology* 2006;115:276–287. [PubMed: 16737392]
- Hu LT, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling* 1999;6:1–55.
- Karpman B. On the need for separating psychopathy into two distinct clinical types: Symptomatic and idiopathic. *Journal of Criminology and Psychopathology* 1941;3:112–137.
- Krueger RF. The structure of common mental disorders. *Archives of General Psychiatry* 1999;56:921–926. [PubMed: 10530634]
- Krueger RF, Caspi A, Moffitt TE, Silva PA. The structure and stability of common mental disorders (*DSM-III-R*): A longitudinal-epidemiological study. *Journal of Abnormal Psychology* 1998;107:216–227. [PubMed: 9604551]
- Krueger RF, Hicks B, Patrick CJ, Carlson SR, Iacono WG, McGue M. Etiologic connections among substance dependence, antisocial behavior, and personality: Modeling the externalizing spectrum. *Journal of Abnormal Psychology* 2002;111:411–424. [PubMed: 12150417]
- Krueger RF, Markon KE. Reinterpreting comorbidity: A model-based approach to understanding and classifying psychopathology. *Annual Review of Clinical Psychology* 2006;2:111–133.
- Krueger RF, Markon KE, Patrick CJ, Benning SD, Kramer MD. Linking antisocial behavior, substance use, and personality: An integrative quantitative model of the adult externalizing spectrum. *Journal of Abnormal Psychology* 2007;116:645–666. [PubMed: 18020714]
- Levenston GK, Patrick CJ, Bradley MM, Lang PJ. The psychopath as observer: Emotion and attention in picture processing. *Journal of Abnormal Psychology* 2000;109:373–385. [PubMed: 11016107]
- Lilienfeld SO, Andrews BP. Development and preliminary validation of a self-report measure of psychopathic personality traits in noncriminal populations. *Journal of Personality Assessment* 1996;66:488–524. [PubMed: 8667144]
- Lykken DT. A study of anxiety in the sociopathic personality. *Journal of Abnormal and Social Psychology* 1957;55:6–10.
- Lykken, DT. *The antisocial personalities*. Mahwah, NJ: Erlbaum; 1995.
- Lynam DR. Pursuing the psychopath: Capturing the fledgling psychopath in a nomological net. *Journal of Abnormal Psychology* 1997;106:425–438. [PubMed: 9241944]
- Lynam, DR.; Derefinko, KJ. Psychopathy and personality. In: Patrick, CJ., editor. *Handbook of psychopathy*. New York: Guilford; 2006. p. 133-155.
- McCrae RR, Zonderman A, Costa PT Jr, Bond MH, Paunonen SV. Evaluating replicability of factors in the Revised NEO Personality Inventory: Confirmatory factor analyses versus Procrustes rotation. *Journal of Personality and Social Psychology* 1996;70:552–556.
- McHoskey JW, Worzel W, Szyarto C. Machiavellianism and psychopathy. *Journal of Personality and Social Psychology* 1998;74:192–210. [PubMed: 9457782]
- Maasen GH, Baker AB. Suppressor variables in path models: Definitions and interpretations. *Sociological Methods and Research* 2001;30:241–270.
- Marsh HW, Hau KT, Wen Z. In search of golden rules: Comment on hypothesis-testing approaches to setting cutoff values for fit indexes and dangers in overgeneralizing Hu and Bentler's (1999) findings. *Structural Equation Modeling* 2004;11:320–341.
- Mineka S. Comorbidity of anxiety and unipolar mood disorders. *Annual Review of Psychology* 1998;49:377–412.
- Morey, LC. *Personality Assessment Inventory professional manual*. 2nd. Lutz, FL: Psychological Assessment Resources; 2007.
- Muthén, LK.; Muthén, BO. *Mplus* [Computer software]. Los Angeles: Muthén & Muthén; 1998-2006.

- Neumann CS, Malterer MB, Newman JP. Factor Structure of the Psychopathic Personality Inventory (PPI): Findings from a large incarcerated sample. *Psychological Assessment* 2008;20:169–174. [PubMed: 18557694]
- Patrick CJ. Emotion and psychopathy: Startling new insights. *Psychophysiology* 1994;31:319–330. [PubMed: 10690912]
- Patrick CJ, Bradley MM, Lang PJ. Emotion in the criminal psychopath: Startle reflex modification. *Journal of Abnormal Psychology* 1993;102:82–92. [PubMed: 8436703]
- Patrick CJ, Curtin JJ, Tellegen A. Development and validation of a brief form of the Multidimensional Personality Questionnaire. *Psychological Assessment* 2002;14:150–163. [PubMed: 12056077]
- Patrick CJ, Edens JF, Poythress NG, Lilienfeld SO, Benning SD. Construct validity of the Psychopathic Personality Inventory two factor model with offenders. *Psychological Assessment* 2006;18:204–208. [PubMed: 16768596]
- Patrick CJ, Fowles DC, Krueger RF. Triarchic conceptualization of psychopathy: Developmental origins of disinhibition, boldness, and meanness. *Development and Psychopathology*. in press.
- Patrick CJ, Hicks BM, Krueger RF, Lang AR. Relations between psychopathy facets and externalizing in a criminal offender sample. *Journal of Personality Disorders* 2005;19:339–356. [PubMed: 16178678]
- Paulhus DL, Robins RW, Trzesniewski KH, Tracy JL. Two replicable suppressor situations in personality research. *Multivariate Behavioral Research* 2004;39:303–328.
- Poythress NG, Dembo R, Wareham J, Greenbaum PE. Construct validity of the Youth Psychopathic Traits Inventory (YPI) and the Antisocial Process Screening Device (APSD) with justice-involved adolescents. *Criminal Justice & Behavior* 2006;33:26–55.
- Poythress NG, Lilienfeld SO, Skeem JL, Douglas KS, Edens JF, Epstein M. The Psychopathic Personality Inventory and Levenson Primary and Secondary Psychopathy Scales: An examination and comparison of construct validity. Manuscript under review. 2009
- Reardon ML, Lang AR, Patrick CJ. Antisociality and alcohol problems: An evaluation of subtypes, drinking motives, and family history in incarcerated men. *Alcoholism: Clinical and Experimental Research* 2002;26:1188–1197.
- Ross SR, Benning SD, Patrick CJ, Thompson A, Thurston A. Factors of the Psychopathic Personality Inventory: Criterion-related validity and relationship to the BIS/BAS and Five-Factor models of personality. *Assessment* 2009;16:71–87. [PubMed: 18703823]
- Ruiz MA, Edens JF. Recovery and replication of internalizing and externalizing dimensions within the Personality Assessment Inventory. *Journal of Personality Assessment* 2008;90:585–592. [PubMed: 18925500]
- Sandoval AR, Hancock D, Poythress NG, Edens JF, Lilienfeld SO. Construct validity of the Psychopathic Personality Inventory in a correctional sample. *Journal of Personality Assessment* 2000;74:262–281. [PubMed: 10879355]
- Sellbom M, Ben-Porath YS, Lilienfeld SO, Patrick CJ, Graham JR. Assessing psychopathic personality traits with the MMPI-2. *Journal of Personality Assessment* 2005;85:334–343. [PubMed: 16318573]
- Schmitt WA, Newman JP. Are all psychopathic individuals low anxious? *Journal of Abnormal Psychology* 1999;108:353–358. [PubMed: 10369046]
- Shine JH, Hobson JA. Construct validity of the Hare Psychopathy Checklist—Revised on a U.K. prison population. *Journal of Forensic Psychiatry* 1997;8:546–561.
- Skeem JL, Mulvey E. Psychopathy and community violence among civil psychiatric patients: Results from the MacArthur Violence Risk Assessment Study. *Journal of Consulting and Clinical Psychology* 2001;69:358–374. [PubMed: 11495166]
- Smith SS, Newman JP. Alcohol and drug abuse in psychopathic and nonpsychopathic criminal offenders. *Journal of Abnormal Psychology* 1990;99:430–439. [PubMed: 2266219]
- Uzieblo K, Verschuere B, Crombez G. The Psychopathic Personality Inventory: Construct validity of the two-factor structure. *Personality and Individual Differences* 2007;43:657–667.
- Vanman EJ, Mejia VY, Dawson ME, Schell AM, Raine A. Modification of the startle reflex in a community sample: Do one or two dimensions of psychopathy underlie emotional processing? *Personality and Individual Differences* 2003;35:2007–2021.

- Verona E, Hicks BM, Patrick CJ. Psychopathy and suicidal behavior in female offenders: Mediating influences of personality and abuse. *Journal of Consulting and Clinical Psychology* 2005;73:1065–1073. [PubMed: 16392980]
- Verona E, Patrick CJ, Curtin JJ, Bradley MM, Lang PJ. Psychopathy and physiological response to emotionally evocative sounds. *Journal of Abnormal Psychology* 2004;113:99–108. [PubMed: 14992662]
- Verona E, Patrick CJ, Joiner TE. Psychopathy, antisocial personality, and suicide risk. *Journal of Abnormal Psychology* 2001;110:462–470. [PubMed: 11502089]
- Vitale JE, Smith SS, Brinkley CA, Newman JP. The reliability and validity of the Psychopathy Checklist–Revised in a sample of female offenders. *Criminal Justice and Behavior* 2002;29:202–231.
- Vollebergh WAM, Iedema J, Bijl RV, de Graaf R, Smit F, Ormel J. The structure and stability of common mental disorders. The NEMESIS study. *Archives of General Psychiatry* 2001;58:597–603. [PubMed: 11386990]
- Westen D, Rosenthal R. Quantifying construct validity: Two simple measures. *Journal of Personality and Social Psychology* 2003;84:608–618. [PubMed: 12635920]
- Wiggins, JS. *Personality and prediction: Principles of personality assessment*. New York: Addison-Wesley; 1973.
- Wilson DL, Frick PJ, Clements CB. Gender, somatization, and psychopathic traits in a college sample. *Journal of Psychopathology and Behavioral Assessment* 1999;21:221–235.
- Witt EA, Donnellan MB, Blonigen DM, Krueger RF, Conger RD. Assessment of Fearless Dominance and Impulsive Antisociality via Normal Personality Measures: Convergent Validity, Criterion Validity, and Developmental Change. *Journal of Personality Assessment* 2009;91:265–276. [PubMed: 19365767]



**Figure 1.** Measurement Model of PAI-based Internalizing and Externalizing. ANX = Anxiety, ARD = Anxiety-Related Disorders, DEP = Depression, ANT = Antisocial Features, AGG = Aggression, ALC = Alcohol Problems, DRG = Drug Problems. \*\*  $p < .01$ , \*  $p < .05$ .



**Table 1**  
**Structural Relations between PPI & PCL-R Total and Factor Scores and Latent Internalizing & Externalizing Criterion Variables**

Latent Criterion Variables	PPI			
	Zero-Order ( <i>r</i> )			
	Total Scores	PPI-1	PPI-2	
Internalizing	.14**	-.51**	.52**	
Externalizing	.74**	.16**	.79**	
	PCL-R			
Latent Criterion Variables	Zero-Order ( <i>r</i> )		First-Order ( $\beta$ )	
	Total Scores	Factor 1	Factor 2	Factor 2
		Factor 1	Factor 2	Factor 2
Internalizing	-.03	-.12**	.08**	-.21**
Externalizing	.37**	.04	.50**	-.12**
				.56**

*Note.* PPI = Psychopathic Personality Inventory; PCL-R = Psychopathy Checklist-Revised. Zero-Order (*r*) = correlations between psychopathy factors and Internalizing and Externalizing when evaluated as single predictors in the model. First-Order ( $\beta$ ) = beta weights for psychopathy factors when entered together as predictors of Internalizing and Externalizing in the model.

\*\*  $p < .01$

**Table 2**  
**Relations between Psychopathy Total and Factor Scores and Externalizing Composites by Measurement Domain**

Criterion Variables	Zero-Order ( <i>r</i> )			
	PPI Total	PPI-1	PPI-2	
Self-report				
ANT/AGG composite	<b>.70**</b>	<b>.15**</b>	<b>.69**</b>	
Interview				
CD/AAB composite	<b>.49**</b>	<b>.14**</b>	<b>.44**</b>	
				First-Order ( $\beta$ )
Criterion Variables	PCL-R Total	PCL-R Factor 1	PCL-R Factor 2	PCL-R Factor 2
Self-report				
ANT/AGG composite	<b>.37**</b>	<b>.19**</b>	<b>.45**</b>	<b>.47**</b>
Interview				
CD/AAB composite	<b>.66**</b>	<b>.43**</b>	<b>.70**</b>	<b>.65**</b>

*Note.* PPI = Psychopathic Personality Inventory. PCL-R = Psychopathy Checklist-Revised. ANT = PAI-Antisocial Features, AGG = PAI-Aggression. CD = SCID-based conduct disorder symptoms, AAB = SCID-based adult antisocial behavior symptoms. Composites are observed variables and represent average z-scores of respective scales. Bold = correlations within the same assessment domain. Italics = correlations significantly different across measurement domains within each predictor.

\*\*  
 $p < .01$