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Factors of the Psychopathic Personality Inventory: Criterion-Related Validity and Relationship to the BIS/BAS and Five-Factor Models of Personality

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Psychopathy is a personality disorder that includes interpersonal-affective and antisocial deviance features. The Psychopathic Personality Inventory (PPI) contains two underlying factors (fearless dominance and impulsive antisociality) that may differentially tap these two sets of features. In a mixed-gender sample of undergraduates and prisoners, we found that PPI fearless dominance was related to low Behavioral Inhibition System activity, high Behavioral Activation System (BAS) activity, expert prototype psychopathy scores, and primary psychopathy. Impulsive antisociality was related to high BAS activity and all psychopathy measures. High Extraversion and Openness and low Neuroticism and Agreeableness predicted fearless dominance, whereas high Neuroticism and low Agreeableness and Conscientiousness predicted impulsive antisociality. Although low levels of Agreeableness predicted both PPI factors, their differential relations with other five-factor model traits highlight differences in the way psychopathy manifests itself. Consistent with movements toward assessing personality disorder using the five-factor model, the authors report regression-based equations for the clinical assessment of these psychopathy dimensions using the NEO-PI-R.

Keywords: *Psychopathic Personality Inventory; fearless dominance; impulsive antisociality; five-factor model; NEO-PI-R; psychopathy; personality*

Since Cleckley (1941/1988) described psychopathy as a paradoxical mixture of superficial normalcy and deeper underlying pathology, researchers have been interested in delineating the components of the psychopathic personality. Similar to other recent self-report measures of psychopathy, the Psychopathic Personality Inventory (PPI; Lilienfeld & Andrews, 1996), a comprehensive self-report measure of the personality characteristics in psychopathy, contains two underlying factors that appear to have differential diagnostic, demographic, and personality correlates (Benning, Patrick, Hicks, Blonigen, & Krueger, 2003). These factors may index fundamentally different personality constructs in psychopathy. Here, we examined the factors of the PPI in a sample of undergraduate and incarcerated men and women and explored their relations with the domains and facets

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of the five-factor model (FFM) of normal-range personality embodied in the NEO Personality Inventory–Revised (NEO-PI-R; Costa & McCrae, 1992). To further establish their validity, we also examined the relationships of PPI factor scores with criterion variables, including Carver and White's (1994) Behavioral Inhibition System (BIS) and Behavioral Activation System (BAS) scales, an expert-generated FFM prototype of the psychopathic personality (Miller, Lynam, Widiger, & Leukefeld, 2001), and the primary and secondary psychopathy scales of Levenson's Self-Report Psychopathy Scale (LSRP; Levenson, Kiehl, & Fitzpatrick, 1995).

The Psychopathic Personality Inventory and Its Factors

The PPI was developed to avoid contaminating the measurement of psychopathic personality features with assessment of the overtly antisocial behaviors that psychopaths are notorious for exhibiting (Lilienfeld & Andrews, 1996). A growing body of literature suggests that the PPI provides a valid assessment of psychopathy. Total PPI scores show substantial relations with global ratings of Cleckley psychopathy (Lilienfeld & Andrews, 1996) as well as with scores on the Psychopathy Checklist–Revised, or PCL-R (*r*s between .54 and .58; Berardino, Meloy, Sherman, & Jacobs, 2005; Poythress, Edens, & Lilienfeld, 1998), and on the Antisocial Features scale of Morey's (1991) Personality Assessment Inventory (Edens, Poythress, & Watkins, 2001). PPI total scores are also positively related to institutional disciplinary infractions (Edens et al., 2001) as well as aggressive, borderline, and dominant personality features in offenders (Edens et al., 2001; Sandoval, Hancock, Poythress, Edens, & Lilienfeld, 2000).

The PPI contains two dominant factors, in which the interpersonal-affective and antisocial deviance features of the disorder are represented by two orthogonal factors (Benning et al., 2003). The interpersonal-affective factor, termed *PPI-I* (Benning et al., 2003) or *fearless dominance* (Benning, Patrick, Blonigen, Hicks, & Iacono, 2005), is defined by the scales of Social Potency, Fearlessness, and Stress Immunity. Scores on fearless dominance are related to adult symptoms of antisocial personality disorder, higher socioeconomic status, and high dominance, low anxiety, and enjoyment of physically dangerous activities (Benning et al., 2003). This factor also correlates preferentially with Factor 1 of Hare's Self-Report Psychopathy Scale-II (SRP-II; Benning, Patrick, Salekin, & Leistico, 2005) and with PCL-R Factor 1 (r = .38), particularly its interpersonal facet (r = .36; Berardino et al., 2005). It appears to represent a protective factor against a variety of internalizing psychopathology, particularly personality disorders in the anxious/fearful cluster (Benning, Patrick, Salekin, et al., 2005).

Conversely, the antisocial factor—termed *PPI-II* (Benning et al., 2003) or *impulsive antisociality* (Benning, Patrick, Blonigen, et al., 2005)—is marked by the subscales of Machiavellian Egocentricity (which indexes aggressive personality features), Blame Externalization (a measure of alienation), Carefree Nonplanfulness, and Impulsive Nonconformity. Impulsive antisociality correlates with both child and adult symptoms of antisocial behavior, high substance abuse and dependence symptoms, lower socioeconomic status and verbal IQ, high alienation and aggression, low planful control and traditionalism, and low social closeness (Benning et al., 2003). It also correlates preferentially with SRP-II Factor 2, the self-report version of the Antisocial Process Screening Device (Benning, Patrick, Salekin, et al., 2005), and PCL-R Factor 2 (r = .49; Berardino et al., 2005). It appears to represent a vulnerability to a range of externalizing psychopathology, particularly the erratic and dramatic personality disorders (Benning, Patrick, Salekin, et al., 2005).

The divergent external correlates of the factors of the PPI stand is in striking contrast with the factors of other self-report measures of psychopathy, such as the LSRP, which often share external correlates between factors. For example, despite the fact that the primary psychopathy scale of the LSRP was designed to assess more of the conning and manipulative features in psychopathy than the secondary psychopathy scale, both LSRP factors seem equally related to the construct of Machiavellianism (Jakobwitz & Egan, 2006; McHoskey, Worzel, & Szyzarto, 1998). Furthermore, though the LSRP secondary psychopathy scale was designed to measure the aggressive and impulsive features of psychopathy, both LSRP factors are equally related to violent criminal offenses (Brinkley, Newman, Widiger, & Lynam, 2004). In addition, LSRP primary psychopathy appears to be orthogonal to anxiety (Levenson et al., 1995), which is inconsistent with a number of clinical descriptions that emphasize the role of low fear and anxiety in primary psychopaths (e.g., Blackburn, 1975; Lykken, 1995). Therefore, it is unclear to what degree the factors of the PPI correspond to those of the LSRP.

Thus far, the PPI has demonstrated expected relationships with observable measures of related

constructs in nomological networks surrounding psychopathy. For the purposes of establishing construct validity, Cronbach and Meehl (1955) **[QQ: Pls include in ref. list.]** proposed the concept of the *nomological network* to advance measurement theory. Although relationships between observed variables allow for establishing criterion validity, a nomological network goes further by specifying relationships between theoretical constructs, which are tied to these observable variables. The nomological network is an inherently holistic model, as every theoretical construct is also linked to other constructs in the network, that broadens as the relations between the initial nodes and additional variables are determined. As a result, open-ended constructs gain specificity and clarification through subsequent investigations of their relationships with other theoretically meaningful constructs in the network.

Gray–Fowles Behavioral Inhibition and Activation Systems

One such set of related theoretical constructs are the conceptual nervous systems proposed by Gray (1987), which specify a three-factor model of motivation. Two key components of this model are the Behavioral Inhibition System (BIS), which mediates behavioral response to warning signals or punishment cues and is associated with the experience of anxiety, and the Behavioral Activation System (BAS), which mediates responsiveness to appetitive or reward cues and is theorized to underlie individual differences in impulsivity. A third ("fight/flight") system mediates responsiveness to unconditioned punishment cues and is associated with the experience of extreme fear or terror. Research with humans has largely focused on the BIS and BAS systems as constructs underlying defensive and appetitive motivation, respectively.

Fowles (1980) detailed how these conceptual nervous systems should be related to different subtypes of psychopathy. He proposed that individuals who would be considered primary psychopaths—that is, who are narcissistic and low in anxiety (Blackburn, 1975; Lykken, 1995), similar to individuals high in fearless dominance—would have reduced BIS activity, allowing them to commit acts that ordinary individuals would not because of anticipatory anxiety. In contrast, he theorized that secondary psychopaths—aggressive and impulsive individuals (Blackburn, 1975; Lykken, 1995), like those high in impulsive antisociality–would instead have heightened BAS activity, which would impel these individuals to behave more actively and vigorously. However, he also theorized that primary psychopaths may exhibit elevated BAS activity.

Although studies examining Gray's model and psychopathy have been limited, Newman, MacCoon, Vaughn, and Sadeh (2005) found support for these predictions in a recent investigation of incarcerated individuals in which primary psychopaths (high on PCL-R Factor 1 and low on the Welsh Anxiety Scale) scored lower on Carver and White's (1994) BIS scale, whereas secondary psychopaths (high on PCL-R Factor 2 and high on the Welsh Anxiety Scale) scored higher on the Carver and White (1994) BAS scale, compared with control participants. However, the factors of the LSRP appear weakly or nonsignificantly related to the BIS and BAS scales (Lilienfeld & Hess, 2001). Thus, it is important to clarify the relationships of the PPI factors with the BIS and BAS constructs to help understand the motivational systems that may underlie these factors of psychopathy.

Psychopathy and Normal-Range Personality Traits

Inasmuch as psychopathy is a personality disorder, its factors should have unique and robust associations within the nomological network surrounding other personality dimensions. Both PPI factors were estimated well by the Multidimensional Personality Questionnaire (MPQ; Tellegen, in press), a broad-band measure of normal-range personality traits (disattenuated multiple $R = .89$ and .84 for fearless dominance and impulsive antisociality, respectively; Benning, Patrick, Blonigen, et al., 2005), suggesting that normal-range personality dimensions could be used to measure the factors of psychopathy embodied in the PPI. Benning, Patrick, Blonigen, et al. (2005) found that MPQ-estimated PPI factors had divergent diagnostic and personality correlates similar to those of the factors of the PPI themselves. Fearless dominance was negatively related to diagnostic and personality features related to fear and anxiety; and it was positively related to narcissism, thrill and adventure seeking, and the interpersonal facet of Factor 1 of the PCL-R. In contrast, impulsive antisociality was related to diagnostic and personality markers of antisocial behavior and substance use, impulsivity, boredom susceptibility, and the lifestyle facet of Factor 2 of the PCL-R.

Paralleling these results, in a study examining subtypes of prisoners diagnosed with psychopathy (i.e., who had scores above 30 on the PCL-R), "emotionally stable" individuals high in PCL-R psychopathy

were elevated only on fearless dominance, whereas "aggressive" individuals high in PCL-R psychopathy were elevated only on impulsive antisociality compared with nonpsychopathic prisoners (Hicks, Markon, Patrick, Krueger, & Newman, 2004). Additionally, fearless dominance and impulsive antisociality have each been shown to be approximately 50% heritable (Blonigen, Hicks, Krueger, Patrick, & Iacono, 2005). On an etiological level, fearless dominance is inversely related ($r = -.40$) to the genetic factors underpinning internalizing disorders, and impulsive antisociality is positively correlated ($r = .49$) with the genetic factors underpinning externalizing disorders (Blonigen et al., 2005).

Thus, the factors of the PPI appear to be captured well by normal-range personality traits in Tellegen's three-factor model of personality, as operationalized by the MPQ. However, another model of normal-range personality that has drawn considerable attention from psychopathy researchers is the five-factor model (FFM). In the FFM, psychopathy is conceptualized as a mixture of extremes on normal-range personality traits encompassing five basic domains: Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness (Widiger & Lynam, 1998). Using PCL-R criteria as guidelines for theoretical specification, Widiger and Lynam suggested that both Factor 1 and 2 relate to low Agreeableness, where differences are presumed for facets reflecting low Neuroticism on Factor 1 and high Neuroticism and low Conscientiousness on Factor 2. Empirical investigations of psychopathy and the FFM have generally supported these theoretical predictions.

The factors of the PPI have been previously investigated at the domain level of the FFM. Fearless dominance has been associated with low Neuroticism and Agreeableness along with high Extraversion and Openness, whereas impulsive antisociality has been consistently associated with high Neuroticism and low Agreeableness (Benning, Patrick, Salekin, et al., 2005; Derefinko & Lynam, 2006). In contrast, LSRP primary psychopathy was related only to low Agreeableness, whereas LSRP secondary psychopathy was related to high Neuroticism and low Agreeableness and Conscientiousness (Lynam, Whiteside, & Jones, 1999; Ross, Lutz, & Bailley, 2004). Taken together, these results suggest that low Agreeableness is the FFM personality trait most related to overall psychopathy as indexed by the PCL-R; furthermore, Agreeableness may be the trait variable that the two correlated factors of the PCL-R have in common (Brinkley, Schmitt, Smith, & Newman, 2001; Widiger & Lynam, 1998). From this perspective, from the standpoint of what the PCL-R measures, instruments purporting to measure psychopathy and its factors would be expected to exhibit negative associations with Agreeableness. On the other hand, at the domain level, the role of Neuroticism in self-report-based psychopathy is unclear.

Exploring psychopathy's relationships with the facets of each higher order domain clarifies this and other conundrums. Indeed, specificity at the facet level of personality is often needed to fully describe personality disorders in the FFM (e.g., Lynam & Widiger, 2001; Ross, Lutz, & Bailley, 2002; Trull, 1992). To this end, multiple regression has been useful in delineating FFM facets most indicative of particular personality disorders (Trull, Widiger, & Burr, 2001). For example, De Clercq and De Fruyt (2003) found that even after controlling for a "general psychopathology factor", theoretically specified FFM facets accounted for an average of 54% of the variance in personality disorders. Although similar research has focused on testing a priori hypotheses in the FFM, this multivariate approach may be useful in developing regression formulas based on NEO-PI-R facet (and domain) scales for the purposes of identifying personality disorder in individuals. With regard to psychopathy, Ross et al. (2004) found that a multivariate combination of facet scales from the NEO-PI-R (Costa & McCrae, 1992) accounted for 64% of the variance ($R = .80$) in LSRP primary psychopathy and 56% of the variance ($R = .75$) in LSRP secondary psychopathy. Their findings suggest that psychopathy is well-represented at the facet level and may be accurately identified using regression formulas that capture a particular pattern of elevations on the NEO-PI-R. However, similar regression equations have not been generated for the PPI factors at the facet level of the FFM.

Another approach to studying the personality features of psychopathy involves having experts rate the prototypical psychopath on a variety of normal-range personality dimensions. Miller et al. (2001) asked experts in the field of psychopathy to complete bipolar ratings of the psychopathic prototypicality of each of the 30 facets of the NEO-PI-R. In this prototype, psychopathy was related to each facet of low Agreeableness, and it showed selective relations with specific facets of other FFM domains. Based on their findings, Lynam and colleagues concluded that "psychopathy consists of very low scores on all facets of Agreeableness" (Miller et al., 2001, p. 271). FFM prototype scores were also negatively predicted by

internalizing disorder symptoms and positively by externalizing disorder symptoms generally, and antisocial personality disorder symptoms specifically (Miller et al., 2001). Furthermore, scores reflecting the degree of correspondence between each person's NEO-PI-R profile and the expert-generated psychopathy prototype correlated .46 with total self-reported psychopathy scores on the LSRP. Greater correspondence with the expert psychopathy prototype was also related to higher levels of aggression and impulsivity in laboratory tasks (Miller & Lynam, 2003). Thus, if the two factors of the PPI each represent valid factors of psychopathy, they should each exhibit robust associations with the FFM prototype of psychopathy.

Current Study

To examine the FFM correlates of fearless dominance and impulsive antisociality, we administered the PPI along with the NEO-PI-R, which assesses the FFM personality dimensions. We also administered self-report measures of BIS/BAS system activity (Carver & White, 1994) to examine the relationships of the PPI factors to Fowles's (1980) model of Behavioral Inhibition and Activation. By including both the Miller et al. (2001) psychopathy prototype and LSRP measures, we were also able to examine the relations of the PPI factors to the overarching psychopathy construct and another putative measure of its distinctive factors, respectively. Additionally, we used a sample comprising male and female undergraduates and prisoners to examine whether the factors of the PPI had different patterns of correlations across these groups.

Because of the lack of anxiety represented in fearless dominance, we expected that this PPI factor would be significantly related to low BIS activity. In contrast, because of its negative association with behavioral constraint, we predicted that impulsive antisociality would be significantly related to high BAS activity. Furthermore, because we believe that both factors of the PPI index constructs central to psychopathy, we hypothesized that both PPI factors would relate to Miller et al.'s (2001) prototypical psychopathic personality profile. Conversely, we expected that PPI fearless dominance would relate only with LSRP primary psychopathy, and that LSRP secondary psychopathy scores would be related to PPI impulsive antisociality. Based on previously reported relations between the PPI factors and personality trait measures (Benning et al., 2003, Benning, Patrick, Blonigen, et al., 2005; Benning, Patrick, Salekin, et al., 2005; Derefinko & Lynam, 2006), we predicted that fearless dominance would be significantly predicted by high Extraversion and low Neuroticism and Agreeableness, and that impulsive antisociality would be significantly predicted by low Agreeableness and Conscientiousness. Finally, we used multiple regression to (a) identify the most important facet scale predictors of the PPI factors, and (b) determine the likely generalizability of regression-based predicted values using NEO-FFI domain and NEO-PI-R facet scales to predict fearless dominance and impulsive antisociality.

Method

Participants

A total of 134 students attending a small Midwestern liberal arts university and 169 offenders from medium security state correctional facilities comprised the total sample. The PPI includes two validity indices: the Variable Response Inconsistency Scale and the Deviant Responding Scale, and a social desirability measure, the Unlikely Virtues Scale. Participants were excluded from analyses if they had a Variable Response Inconsistency (n = 14) or a Deviant Response (n = 4) score more than 3 *SD* above the mean for the pooled sample, leaving a total of 293 participants (38 male students, 96 female students; 88 male prisoners, 71 female prisoners). For students, the average age was 20.8 (SD = 6.2) years; racial composition was Caucasian (74.4%), African American (11.2%), Latino (3.8%), Native American (6.8%), or Other (3.8%). Median reported family income was in the $60,000 to $80,000 range; across participants, the median educational level for both father and mother was a bachelor's degree. In offenders, the average age was 35.4 (SD = 9.6) years; racial composition was Caucasian (68.6%), African American (21.4%), Latino (1.9%), Native American (3.1%), or Other (5.0%). Median reported family income was in the $20,000 to $40,000 range; across participants, the median educational level for both father and mother was a GED. All participants were assessed with all the measures listed below.

Measures

Psychopathy Indices

Psychopathic Personality Inventory. The PPI was developed by Lilienfeld and Andrews (1996) as a self-report measure to assess the spectrum of personality

traits relevant to psychopathy. It consists of 187 items, answered using a 4-point Likert-type scale ranging from 1 (*false*) to 4 (*true*). The PPI yields a total psychopathy index, as well as scores on eight-trait subscales (e.g., Blame Externalization, Machiavellian Egocentricity). These subscales were derived using factor analysis of candidate items developed based on an inclusive and comprehensive review of the psychopathy literature (Lilienfeld & Andrews, 1996). Lilienfeld and Andrews (1996) have reported high internal consistency for the PPI total score, ranging from .89 to .93. Internal consistency for the eight PPI subscales ranged from .70 to .90 (Lilienfeld & Andrews, 1996). In the current study, coefficient alpha for the PPI total score was .94, and coefficients for PPI subscales ranged from .80 for Coldheartedness to .90 for Machiavellian Egocentricity.

Levenson Self-Report Psychopathy Scales (Levenson et al., 1995). The LSRP was developed to assess psychopathic attitudes and beliefs via self-report. Twenty-six items comprise two subscales designed to measure both factors of the PCL-R in noninstitutionalized young adults. The primary psychopathy subscale consists of 16 items measuring an inclination to lie, lack of remorse, callousness, and manipulativeness (sample item = "I enjoy manipulating other people's feelings"). Coefficient alpha for the current sample was .85. The secondary psychopathy subscale consists of 10 items measuring impulsivity, frustration tolerance, quick-temperedness, and lack of long-term goals (sample item = "I find myself in the same kinds of trouble, time after time"). Coefficient alpha in the current sample was .71. Initial validation studies by Levenson et al. indicate that the LSRP scales significantly predict reports of antisocial behavior and are positively related to the boredom susceptibility and disinhibition facets of sensation seeking (Zuckerman, 1979) in college samples. Two additional studies conducted by Lynam et al. (1999) provided further support for the validity of the LSRP scales in relation to self-report measures of antisocial tendencies and clinician prototype ratings of psychopathy. Finally, Brinkley et al. (2001) provided limited evidence for the validity of the LSRP for assessing psychopathy in institutionalized offenders.

FFM psychopathy prototype (Miller et al., 2001). The resemblance of each participant's NEO-PI-R profile to Miller et al. (2001)'s facet-level FFM prototype for psychopathy was calculated as a *Q* correlation. Specifically, to center FFM facet scores around the midpoint of each scale, scores on each facet for the FFM psychopathy prototype were rescaled to range from −2 to 2 by subtracting 3 from the values reported in Miller et al. (2001), then multiplied by 8 to account for the number of items on each NEO-PI-R facet, yielding a final score ranging from −16 to +16. Likewise, 24 was subtracted from participants' scores on each facet of the NEO-PI-R to rescale them to range between −16 to +16. The sum of the squared differences between the participants' rescaled scores on each NEO-PI-R facet and the rescaled score on that facet for the FFM psychopathy prototype were then computed to be the numerator of a disparity fraction. The squared differences of each participant's score from the midpoint on each NEO-PI-R facet were summed, as were the squared differences of each facet-level score of the FFM psychopathy prototype from the midpoint on each NEO-PI-R facet. The sum of these two quantities was then used as the denominator of the disparity fraction. The value of the disparity fraction was then subtracted from 1 to obtain the *Q* correlation, which ranges from −1 to +1 (Brown, 1993).

Scores on this index of psychopathy ranged from −.30 to .63 in this sample (median for prisoners = .26; median for students = .18), with prisoners having significantly higher scores than students, $t(291) = 3.64$, $p < .001$.

Gray–Fowles BIS/BAS Model

Behavioral Inhibition and Behavioral Activation Scales (BIS/BAS; Carver & White, 1994). The BIS scale consists of seven items measuring apprehensive anticipation (e.g., "I worry about making mistakes"). The BAS scale is composed of three subscales: BAS Drive (BAS-D; four items, e.g., "When I want something, I usually go all-out to get it"), BAS Fun-Seeking (BAS-F; four items, e.g., "I often act on the spur of the moment"), and BAS Reward Responsiveness (BAS-R; five items, e.g., "When I get something I want, I feel excited and energized"). All items are Likert-type-scaled (4 points) with anchors of *strongly agree* and *strongly disagree*. Internal consistency as measured by Cronbach's alpha were .76 for BIS and .78 for BAS total score, .75 for BAS Reward Responsiveness, .69 for BAS Drive, and .68 for BAS Fun-Seeking in the student sample. The BIS/BAS scales have been shown to exhibit adequate factorial validity (Jorm et al., 1999) and convergent and discriminant validity (Jorm et al., 1999; Kasch, Rottenberg, Arnow, & Gotlib, 2002; Sutton & Davidson, 1997**[QQ: Pls include Sutton & Davidson, 1997 in the reference list.]**).

Five-Factor Model (FFM)

Revised NEO Personality Inventory. The NEO-PI-R is a self-report questionnaire developed by Costa and McCrae (1992) to assess normal personality dimensions based on the FFM. It consists of 240 items that are rated on a 5-point Likert-type scale with anchors of *strongly disagree* and *strongly agree*. We used this inventory for analyses involving the facets of the FFM. In the NEO-PI-R, each higher order trait or domain scale is composed of six lower order traits or facet scales that are subsumed under each domain. For example, Neuroticism is composed of facet scales of Anxiety, Depression, Angry Hostility, Self-Consciousness, Impulsiveness, and Vulnerability. Coefficient alpha for the facet scales ranged from .44 (Openness to Actions) to .80 (Depression). Besides Openness to Actions, other NEO-PI-R facet score internal consistencies that fell below .60 included Activity (.59), Openness to Values (.59), and Tender-mindedness (.57).

NEO Five-Factor Inventory (NEO-FFI). The NEO-FFI is a subset of 60 items within the NEO-PI-R that was developed to assess the five domains of the FFM in space-limited item batteries (Costa & McCrae, 1992). We used this inventory for analyses involving the domains of the FFM. In this sample, coefficients alpha ranged from .66 for the Openness scale to .84 for the Neuroticism scale.

Data Characteristics and Scoring

All variables in the analyses reported below had a skew and kurtosis less than one. If a participant completed more than 70% of the items on any scale, scores on that scale were prorated to compensate for missing data. If 70% or fewer items were completed, the score for that particular scale was treated as missing.

Procedure

Participants from two state penitentiaries were randomly selected from a pool generated by prison administrators. Offenders had been screened for reading ability above the eighth grade and were contacted by prison officials and asked to participate. For those who agreed, small group–testing sessions were conducted, ranging from 15 to 30 offenders. Participants completed a battery of measures, including a demographics sheet, the NEO-PI-R, LSRP, BIS/BAS, and PPI, in that order. As remuneration, offender participants were given a pizza lunch for their time. Student participants were recruited from undergraduate psychology courses. All were similarly administered the same battery of tests in small groups of 15 to 35. Student participants received cocurricular credit, extra credit in psychology or biology classes, and/or a pizza lunch. The study was approved by the institutional review boards at both the university and state correctional levels.

Data Analysis

The factor structure of the PPI in the current sample closely matched that reported by Benning et al. (2003).[1] We computed scores on the two PPI factors (interfactor $r = .15$, $p > .005$) according to the approach described in that study, and used these factor scores in our primary analyses.[2] Specifically, the subscales that loaded most strongly on one PPI factor or the other were standardized using a z transformation and summed to yield a composite score for each participant on each factor. We examined correlations of these PPI factor scores (along with those of the Coldheartedness scale, which did not load on either fearless dominance or impulsive antisociality) with demographic variables and scores on psychopathy-related inventories and other criterion variables. In addition, we correlated scores on the two PPI factors and Coldheartedness with domain-level and facet-level personality scales from the NEO-FFI and NEO-PI-R, respectively, to assess their relationships with FFM personality dimensions. We also performed multiple regression analyses to examine how well the FFM domain and facet scales predicted PPI factor scores.

We sought to combine data from the various particpant groups for theoretical and statistical reasons. Theoretically, we wanted our sample to cover a diverse range of participants to ensure that our correlational and regression results were generalizable to the largest possible population (cf. Krueger, Markon, Patrick, Benning, & Kramer, in press). Statistically, combining participants yielded greater statistical power to detect relationships among our variables of interest, and it also extended the domain for which our regression equations could be used validly for predicting psychopathic traits from normal-range personality dimensions (cf. Brooks, Carroll, & Verdini, 1988). Including students in the regressions extended the lower boundaries of the regressions' domains, and including prisoners extended the upper boundaries of the domains. However, we examined the validity of combining these data by assessing whether our results for the PPI factors differed between men and women

or students and prisoners. Specifically, we conducted regression analyses predicting each BIS–BAS, psychopathy-related, or FFM personality variable in turn from one PPI factor score, gender, participant group, and the two- and three-way interactions of these variables.

At an alpha level of .05, only a few significant interactions of PPI factor scores with participant gender and/or group were obtained in these analyses. Specifically, the proportion of significant interactions observed in these results was less than the number that would be expected by chance at an alpha level of .05 (10 significant interactions involving PPI factors/376 total interactions involving PPI factors = .027). Furthermore, the only pattern among these interactions was that scores for the domain of Conscientiousness and three of its facets (Dutifulness, Self-Discipline, and Deliberation) had more strongly negative correlations with impulsive antisociality for women than for men (cf. Miller et al., 2001). In light of these results, and the fact that combining samples did not result in significant increases in variability across measures despite the differences in mean scores on many of the variables observed across groups, it seemed reasonable to pool data across samples for our analyses. Nevertheless, to control for the effects of participant group and gender, we present partial correlations in the Results that controlled for the effects of participant gender, group, their interaction, and the interactions of gender and/or group with PPI factor scores (cf. Lynam, Hoyle, & Newman, 2006). To facilitate using our regression equations to predict fearless dominance and impulsive antisociality in the broadest range of samples possible, we did not include terms involving gender or group in the regression results. However, regression results including these terms were essentially identical to those reported here.

To control the experiment-wise error rate, all correlations and regression coefficients were evaluated against a critical alpha of .005. Differences in the relations of each variable with fearless dominance and impulsive antisociality were assessed using Steiger's (1980) test for differences between dependent correlations.

Results

PPI Factors and Demographics, Psychopathy Indices, and BIS/BAS

Table 1 displays the correlations of each PPI factor with the demographic and criterion variables that were available in these samples. Scores on both fearless dominance and impulsive antisociality were higher for men than women and for prisoners than students. Scores on impulsive antisociality were inversely related to self-reported income. Scores on Coldheartedness correlated significantly with gender ($r = .24$, $p < .001$), with men having higher Coldheartedness scores than women; gender- and group-corrected Coldheartedness scores did not correlate with any other demographic variables.

Fearless dominance was strongly related to decreased BIS strength, and both PPI factors correlated positively and about equally with BAS Drive and BAS Fun-Seeking. BAS Reward Responsiveness was not related to either PPI factor. Gender- and group-corrected Coldheartedness was negatively related with BIS ($r = -.36$, $p < .001$) and BAS Reward Responsiveness ($r = -.27$, $p < .001$) scores.

With regard to explicit measures of psychopathy, both PPI factors related strongly to the Miller et al. (2001) facet-level NEO-PI-R psychopathy prototype. Impulsive antisociality was also strongly related to all LSRP psychopathy scores, but fearless dominance was only modestly related to primary psychopathy scores, and not at all to secondary or total LSRP psychopathy scores.[3] Gender- and group-corrected Coldheartedness was related to Miller et al. (2001) psychopathy prototype scores ($r = .47$, $p < .001$), LSRP total scores ($r = .26$, $p < .001$), and LSRP primary psychopathy scores ($r = .37$, $p < .001$).

PPI Factors and FFM Personality Dimensions

Table 2 shows Pearson *r*s and β weights for the prediction of PPI factor scores from NEO-FFI personality domains based on bivariate correlations and multiple regression analyses, respectively. Fearless dominance (multiple $R = .71$) was significantly associated with low Neuroticism, high Extraversion, and low Agreeableness, with a trend toward being associated with high Openness; impulsive antisociality (multiple $R = .79$) was significantly associated with high Neuroticism and low Agreeableness and Conscientiousness. NEO-FFI predicted PPI factor scores correlated .09 ($p > .1$) with each other. On the NEO-FFI, Coldheartedness (multiple $R = .57$) was significantly predicted by low Neuroticism ($\beta = -.42$, $p < .001$), Extraversion ($\beta = -.27$, $p < .001$), Openness ($\beta = -.15$, $p < .005$), and Agreeableness ($\beta = -.36$, $p < .001$).

To investigate how the facet level of personality contributed to predicting PPI factor scores, the facets of the NEO-PI-R were entered into multiple regressions

Table 1
Partial Correlations of PPI Factors With Demographics, Psychopathy Indices, and BIS/BAS Scores

Variable	Fearless Dominance	Impulsive Antisociality	*df*
Demographics			
Participant group	.20**	.28**	293
Gender	.32**	.33**	293
Age	−.17*	−.19*	284
Father's education	.03	.05	264
Mother's education	.07	.08	271
Income	.12	−.07	272
Five-Factor Model Psychopathy Prototype	.50**	.38**	284
LSRP Scales			
Primary psychopathy	.08	.55**	284
Secondary psychopathy	*−.17**	*.63***	284
Total psychopathy	*−.02*	*.70***	284
BIS/BAS Scales			
BIS	*−.57***	*−.02*	284
BAS Reward Responsiveness	.07	.03	283
BAS Drive	.21**	.25**	283
BAS Fun-Seeking	.32**	.36**	284

Note: Participant group was coded as −1 = *university students*, 1 = *prisoners*; gender was coded as −1 = *female*, 1 = *male*. BIS = Behavioral Inhibition System; BAS = Behavioral Activation System; LSRP = Levenson Self-Report Psychopathy. For each PPI factor correlation with criterion variables (besides those with participant gender and group), the effects of participant gender, participant group, and the interactions of that PPI factor with gender, group, and gender and group were partialled out. For each variable, a *t* test for the difference between dependent correlations (Steiger, 1980) was used to evaluate whether correlations differed significantly for fearless dominance versus impulsive antisociality. Coefficients that differed significantly from one another (all $p < .001$) are italicized.
*$p < .005$. **$p < .001$.

Table 2
Partial Correlations and Regression Weights for Predicting PPI Factors From NEO-FFI Domains

	Correlations		Regression Weights	
NEO-FFI Domain	Fearless Dominance	Impulsive Antisociality	Fearless Dominance	Impulsive Antisociality
Neuroticism	*−.53****	*.34****	−.144 (−.53)***	.067 (.19)***
Extraversion	*.43****	*−.03*	.108 (.30)***	.046 (.10)*
Openness to experience	.13	.08	.041 (.11)*	.039 (.08)
Agreeableness	*−.08*	*−.48****	−.124 (−.37)***	−.233 (−.53)***
Conscientiousness	*.08*	*−.53****	−.010 (−.03)	−.176 (−.42)***
Constant			3.26***	8.40***

Note: For all analyses, $n = 293$. NEO-FFI = NEO Five-Factor Inventory. Standardized regression weights are enclosed in parentheses. For each PPI factor correlation with NEO-FFI domain scores, the effects of participant gender, participant group, and the interactions of that PPI factor with gender, group, and gender and group were partialled out. For each pair of domain correlations, a *t*-test for the difference between dependent correlations (Steiger, 1980) was used to evaluate whether correlations differed significantly for fearless dominance versus impulsive antisociality; coefficients that differed significantly from one another (all $p < .001$) are italicized.
*$p < .01$. **$p < .005$. ***$p < .001$.

to predict fearless dominance (multiple $R = .85$) and impulsive antisociality (multiple $R = .84$). Table 3 displays regression weights (along with simple correlations) for the 30 NEO-PI-R facet scales in simultaneous entry linear regressions predicting PPI factor scores. Fearless dominance was significantly predicted by several (reversed) facets of Neuroticism, in addition to the Excitement-Seeking and Assertiveness facets of Extraversion, the Actions facet of Openness, and the (reversed) Straightforwardness facet of Agreeableness. In contrast, the facet-level regression for impulsive antisociality revealed that only the Excitement Seeking facet of Extraversion contributed significantly to prediction of impulsive antisociality,

Table 3
Partial Correlations and Regression Weights for Predicting PPI Factors From NEO-PI-R Facet Scales

	Correlations		Regression Weights	
NEO-PI-R Facet	Fearless Dominance	Impulsive Antisociality	Fearless Dominance	Impulsive Antisociality
Neuroticism				
Anxiety	*–.55***	*.15*	–.108 (–.26)***	–.005 (–.01)
Angry hostility	*–.21***	*.42***	–.034 (–.07)	.058 (.10)
Depression	*–.47***	*.38***	–.012 (–.03)	.063 (.12)
Self-consciousness	*–.57***	*.11*	–.071 (–.16)**	.020 (.03)
Impulsiveness	*–.08*	*.45***	–.006 (–.01)	.044 (.07)
Vulnerability	*–.49***	*.35***	–.113 (–.23)***	–.049 (–.08)
Extraversion				
Warmth	*.23***	*–.24***	–.035 (–.07)	–.039 (–.06)
Gregariousness	*.30***	*.04*	.020 (.05)	–.020 (–.04)
Assertiveness	*.50***	*–.08*	.079 (.18)***	–.023 (–.04)
Activity	*.24***	*–.08*	.006 (.01)	.013 (.02)
Excitement-seeking	.36***	.32***	.154 (.33)***	.099 (.16)***
Positive emotions	*.32***	*–.08*	–.027 (–.06)	.034 (.05)
Openness to experience				
Fantasy	.07	.14	.024 (.06)	–.041 (–.07)
Aesthetics	.14	.05	.017 (.04)	.037 (.07)
Feelings	.08	–.01	–.005 (–.01)	–.081 (–.11)
Actions	*.25***	*.00*	.087 (.13)***	–.009 (–.01)
Ideas	*.18***	*–.06*	.022 (.05)	.040 (.07)
Values	.03	.03	–.034 (–.06)	.003 (.00)
Agreeableness				
Trust	*.16*	*–.39***	–.014 (–.03)	–.047 (–.09)
Straightforwardness	*–.17***	*–.46***	–.069 (–.16)**	–.078(–.14)*
Altruism	*–.02*	*–.29***	.000 (.00)	–.041 (–.06)
Compliance	–.21***	–.38***	–.009 (–.02)	–.089(–.16)*
Modesty	–.25***	–.15	.015 (.03)	–.053 (–.09)
Tender-mindedness	–.08	–.21***	.009 (.01)	.027 (.03)
Conscientiousness				
Competence	*.21***	*–.43***	.026 (.05)	–.035 (–.05)
Order	*.05*	*–.33***	.015 (.03)	–.033 (–.05)
Dutifulness	*.07*	*–.43***	–.011 (–.02)	–.031 (–.05)
Achievement striving	*.16*	*–.43***	.001 (.00)	–.066 (–.11)
Self-discipline	*.11*	*–.56***	–.007 (–.02)	-.122(–.22)***
Deliberation	*.01*	*–.42***	–.023 (–.05)	–.051 (–.09)
Constant	—	—	1.02	9.00***

Note: For all analyses, $n = 293$. NEO-PI-R = NEO Personality Inventory–Revised. Standardized regression weights are enclosed in parentheses. For each PPI factor correlation with NEO-PI-R facet scores, the effects of participant gender, participant group, and the interactions of that PPI factor with gender, group, and gender and group were partialled out. For each pair of facet correlations, a t test for the difference between dependent correlations (Steiger, 1980) was used to evaluate whether correlations differed significantly for fearless dominance versus impulsive antisociality; coefficients that differed significantly from one another (all $p < .002$) are italicized.
*$p < .01$. **$p < .005$. ***$p < .001$.

with facets of Agreeableness (low Straightforwardness and low Compliance) and Conscientiousness (low Self-Discipline) also contributing to prediction. These predicted PPI factor scores correlated .14 ($p > .01$) with each other. With respect to NEO-PI-R facets, Coldheartedness was significantly predicted (multiple $R = .75$) by (reversed) Positive Emotions ($\beta = -.17$, $p < .005$), Openness to Fantasy ($\beta = -.18$, $p < .001$), Openness to Values ($\beta = -.17$, $p < .001$), Straightforwardness ($\beta = -.23$, $p < .001$), and Modesty ($\beta = -.19$, $p < .001$).

Generalizability of NEO-Predicted Values

Of course, without cross-validation, it is questionable whether these regression equations would generalize

to other samples. To test the generalizability of these regression equations, we used a double cross-validation procedure to make maximal use of the data for our entire sample (cf. Benning, Patrick, Blonigen, et al., 2005). We split the sample into odd–even participant number halves and generated regression equations to predict PPI factors using the five NEO-FFI domain scales to obtain a multiple *R* in each half-sample. We then used the regression equation for one half-sample to predict PPI factor scores in the other as a means of assessing validity shrinkage in the prediction of the PPI factors. The current sample size appears adequate for this task, as an *n* of 125 appears to generate discrepancies of .05 or less between sample and population R^2 for this number of predictors with a multiple ρ^2 of .45 (Algina & Keselman, 2000), which is less than half of the current sample size.

Within the first half-sample, the multiple *R*s for fearless dominance and impulsive antisociality were .70 and .80, respectively; within the second half-sample, the multiple *R*s for fearless dominance and impulsive antisociality were .73 and .79, respectively. When the regression weights developed in the second half-sample were applied to the first half-sample, the multiple *R*s for fearless dominance and impulsive antisociality were .68 and .79, respectively. Similarly, when the regression weights developed in the first half-sample were applied to the second half-sample, the multiple *R*s for fearless dominance and impulsive antisociality were .72 and .78, respectively. These coefficients represent validity shrinkage ranging from only 2.5% to 4.3% of the total variance in predicted PPI factor scores. Furthermore, NEO-FFI estimated PPI factor scores derived from alternate half-samples were nearly identical, correlating .98 to .99 with each other. Thus, it seems likely that the regression equations given for this sample will exhibit little validity shrinkage in future samples.

On the whole, the pattern of participant gender- and group-corrected relationships between predicted PPI factors and criterion variables was strikingly similar to that obtained for the actual PPI factors. Only five correlations for the NEO-FFI estimated PPI factors with criterion variables were significantly different from those observed for the actual PPI factors. NEO-PI-R estimated fearless dominance correlated less strongly with participant gender ($r = .21$, $p < .001$), participant age ($r = -.04$, nonsignificant [ns]), and BAS Fun-Seeking ($r = .12$, ns) than did PPI fearless dominance. NEO-PI-R estimated impulsive antisociality correlated less strongly with participant sample ($r = .15$, ns) and father's education ($r = .02$, ns) than did PPI impulsive antisociality. Generally, the weakest effects for actual PPI factors were least likely to be represented on cross-validation using NEO-FFI estimated scores.

For the NEO-PI-R, only the correlations between both estimated PPI factors and the FFM psychopathy prototype were significantly different from those for the actual factors (*r* with NEO-PI-R estimated fearless dominance = .59; *r* with NEO-PI-R estimated impulsive antisociality = .51). However, the correlations for the NEO-PI-R estimated PPI factors were *greater* than those for the actual factors, likely because the FFM psychopathy prototype is also based on NEO-PI-R scores. In addition, NEO-PI-R estimated fearless dominance was more negatively related to LSRP secondary psychopathy ($r = -.27$, $p < .001$) than was the actual fearless dominance factor.

Discussion

In this study, we found that the factors of the PPI were related to BAS activity, and that fearless dominance was inversely related to BIS activity. Impulsive antisociality was preferentially related to both factors of the LSRP, though both factors of the PPI were related to an FFM prototype of psychopathy. We also explicated the relations of the factors of the PPI to the FFM conceptualization of normal-range personality. We found that both factors of the PPI were related to low Agreeableness, consistent with prior work indicating that low Agreeableness is the FFM personality dimension most related to the overall construct of psychopathy indexed by the PCL-R (Brinkley et al., 2001). Also, consistent with theoretical expectations (Benning et al., 2003; Blackburn, 1975; Lykken, 1995), the two PPI factors exhibited differential correlates with other personality dimensions. Fearless dominance was additionally predicted by low Neuroticism and high Extraversion; it was also weakly predicted by high Openness. In contrast, impulsive antisociality was predicted by high Neuroticism and low Agreeableness and Conscientiousness; it was weakly predicted by high Extraversion. Fearless dominance was more richly represented at the facet level of normal personality than impulsive antisociality, particularly with respect to the facets of low Neuroticism.

These personality correlates are largely in line with what is known about the similarities between the NEO-PI-R and MPQ dimensions of normal personality (Church, 1994). They imply that although psychopathy in its broad sense is aligned with the construct of low

Agreeableness, there exist separable components of psychopathy with differential relations to other dimensions of normal (Harpur, Hare, & Hakstian, 1989; Harpur, Hart, & Hare, 1994; Hart & Hare, 1994; Lynam et al., 1999; Patrick, Cuthbert, & Lang, 1994; Ross et al., 2004) and abnormal (Harpur et al., 1989; Hart & Hare, 1989) personality dimensions. Finally, the replicability of the regression equations used to estimate PPI factor scores and the similarity of the external correlates of the FFM-estimated and actual PPI factors suggests that the FFM-estimated PPI factors may be used with confidence in other data sets. These findings are theoretically consistent with multivariate attempts to determine the FFM facets of greatest utility in identifying specific personality disorders.

Comparisons With Other Self-Report Psychopathy Measures

In this study, both factors of the PPI provided unique information about psychopathy as modeled in the FFM. This is to be expected, as the two factors of the PPI are statistically orthogonal and hence should provide independent markers of different facets of psychopathy. In contrast, the secondary psychopathy scale of the LSRP seems to provide information about FFM psychopathy that is somewhat redundant with that contained in the LSRP primary psychopathy scale. This is not surprising, as the two LSRP factors are correlated, and their personality correlates are somewhat similar (Ross et al., 2004). Furthermore, the FFM predictors of impulsive antisociality (i.e., low Agreeableness and Conscientiousness) mirror those of the LSRP scales, implying that they index a construct analogous to the neurotic impulsivity central to Karpman's (1941) original view of secondary psychopathy. These findings, along with the lower IQ and socioeconomic status that are associated with impulsive antisociality and the LSRP scales, also support Mealey's (1995a, 1995b) notion that secondary psychopathy represents a socially disadvantageous phenotype.

The FFM similarity of impulsive antisociality and LSRP primary psychopathy may also explain why LSRP primary psychopathy and fearless dominance were not strongly related to each other. Fearless dominance demonstrated strong relations with FFM personality traits, such as high Extraversion (e.g., Assertiveness) and low Neuroticism (e.g., Anxiety, Self-Consciousness) that have marginal or opposite relationships with LSRP secondary psychopathy and impulsive antisociality. These FFM traits associated with fearless dominance seem to index the social facilitation, charm, and persuasiveness attributed to psychopaths in Cleckley's (1941/1988) original descriptions and in subsequent conceptualizations of primary psychopathy (Lykken, 1995) such as Hare's Self-Report Psychopathy scale–II Factor 1 (Benning, Patrick, Salekin, et al., 2005). However, these socially protective features are unrelated to LSRP primary psychopathy. Instead, LSRP primary psychopathy seems more related to social maladjustment features (e.g., high Angry Hostility, low Compliance) that are prominent in impulsive antisociality, not fearless dominance.

Pathological and Protective Aspects of Fearless Dominance and Impulsive Antisociality

If both factors of the PPI represent important components of psychopathy, fearless dominance seems to be represented by traits associated with *relatively* less impairment or dysfunction (i.e., low Neuroticism, high Extraversion) whereas impulsive antisociality appears most closely related to traits associated with a higher likelihood of failure (i.e., high Neuroticism, low Conscientiousness; Zuckerman, Kieffer, & Knee, 1998). Impulsive antisociality is associated with greater psychopathology, childhood antisocial behavior (Benning et al., 2003), and a disadvantaged background. Similarly, impulsive antisociality was related to psychopathology in a number of ways. Specifically, its interpersonally disagreeable and unconscientious personality correlates are consistent with those of the externalizing vulnerability to psychopathology (Krueger et al., 2002); as noted earlier, impulsive antisociality represents a less adaptive means of controlling or exerting influence (e.g., physical force) in the social milieu.

Hence, the PPI may measure clusters of psychopathic features that have both adaptive and maladaptive consequences. In contrast, the LSRP may be more focused on assessing the maladaptive features of psychopathy. Furthermore, the increased impulsivity associated with the heightened BAS activity involved in impulsive antisociality is congruent with Fowles's (1980) prediction of an overactive BAS in psychopathy. Conversely, fearless dominance seems to index a protective disposition with respect to the anxiety disorders that might arise from an overactive BIS (Gray, 1987). Interestingly, heightened BAS activity associated with both PPI factors is consistent with Gray's original hypotheses regarding secondary psychopathy and with a recent report by Ross et al. (in press) using multiple measures to represent primary and secondary psychopathy as well as Gray's BIS and BAS constructs

in a Spanish sample. Overall, these findings provide additional support for the validity of the PPI factors within the nomological network encompassing Gray's model.

Differences Between PPI Factors at the FFM Domain and Facet Level

Relationships of the PPI factors with NEO-PI-R facet scales within a number of FFM domains further emphasize different ways in which psychopathy seems to manifest across PPI factors. For instance, within the domain of Agreeableness, low Straightforwardness was the facet that best predicted fearless dominance, whereas low Compliance was the facet that best predicted impulsive antisociality. Although these associations point to manipulative tendencies in both PPI factors, impulsive antisociality is further characterized by a tendency to overtly express antagonism toward others, whereas fearless dominance is related positively to the Actions facet of Openness, implying a more agentic orientation toward others. The positive association of fearless dominance with the Assertiveness facet of Extraversion further highlights the use of socially acceptable means to influence others. Overall, these findings at the facet level of the FFM lead to a view of fearless dominance as reflecting psychopathic tendencies that are more likely to be socially tolerated compared with the overt externalization and acting against others embodied in impulsive antisociality.

Differences in their associations with Neuroticism at both the facet and domain level further highlight the divergence of the two PPI factors. Not only do they differ in the direction of their associations with neuroticism (negative for fearless dominance; positive for impulsive antisociality), but relationships at the facet level indicate a very different picture of neurotic tendencies associated with the two factors. Consistent with long-standing conceptualizations of primary psychopathy (Cleckley, 1941/1988; Lykken, 1995), fearless dominance was characterized by the absence of anxiety (low Anxiety; low Self-Consciousness). On the other hand, impulsive antisociality was positively related (on the bivariate level) to the other facets of Neuroticism, consistent with other correlational work on the PPI (Benning, Patrick, Blonigen, et al., 2005; Blonigen et al., 2005) and with the notion that externalizing syndromes are comorbid with internalizing syndromes (such as depression) because of their common relationships with elevated Neuroticism and negative affect. Because the Excitement-Seeking facet of Extraversion is more strongly related to the thrill and adventure seeking component of sensation seeking than its boredom susceptibility component (Aluja, Garcia, & Garcia, 2003**[QQ: Pls include Aluja, Garcia, & Garci in the ref. list.]**), it is sensible that fearless dominance (which is preferentially associated with thrill and adventure seeking) would have a larger multivariate relationship with Excitement-Seeking than impulsive antisociality (which is preferentially associated with boredom susceptibility; Benning et al., 2005).

It is curious that impulsive antisociality, which was so strongly associated with high Neuroticism and low Agreeableness on the domain level, failed to be significantly associated with any of the individual facets of Neuroticism or Agreeableness. However, it is important to recognize that the facet scores comprising each NEO-PI-R domain are saturated with variance from that domain: In this study, the median intercorrelation in this study between the facets of Neuroticism was .46, and that between the facets of Agreeableness was .42. Thus, the facet-level regression analyses in this study removed this multicollinear domain variance from NEO-PI-R facet scores, leaving in the regressions only the unique variance in each facet not associated with overall domain scores (i.e., controlling for NEO-FFI Neuroticism scores, median $r_{partial}$ between Neuroticism facets = −.07; controlling for NEO-FFI Agreeableness scores, median $r_{partial}$ between Neuroticism facets = −.06).

Hence, once the variance in Agreeableness domain scores is removed from its facets via multiple regression, the unique variance in those facets does not have many unique relationships with impulsive antisociality. Therefore, it appears that it is the common variance in the Agreeableness domain that drives the zero-order relationships between impulsive antisociality and the facets of Agreeableness, rather than the variance in these facets that is distinct from the Agreeableness domain score (cf. Lynam et al., 2006). Furthermore, it would suggest that at least with respect to Neuroticism and Agreeableness, impulsive antisociality can be nearly fully represented at the domain level, whereas fearless dominance requires descending to the facet level of personality to be fully explicated.

Coldheartedness as a Uniquely Valid Facet of Psychopathy

Coldheartedness also appears to index a disposition that is not susceptible to experiencing either positive or negative emotions, in contrast to fearless

dominance (which confers a specific lack of anxiety, vulnerability, and self-consciousness) and impulsive antisociality (which confers an excess of neuroticism). Coldheartedness also appears to measure a tendency to be closed minded with respect to fantasies and nontraditional value systems, unlike fearless dominance, which is associated with being open to novel experiences. However, like fearless dominance and impulsive antisociality, Coldheatedness is related to a predilection toward dealing with others in a sneaky or devious manner. Furthermore, a measure of psychopathic immodesty and braggadocio is evident in Coldheartedness's association with low modesty. Thus, Coldheartedness appears to index a part of psychopathy that is phenotypically distinct from both fearless dominance and impulsive antisociality that captures important features of the disorder (e.g., overall shallow affect, grandiosity) that may not be fully captured by either higher order PPI factor. Thus, it may benefit the field to expand and refine the content of the construct captured by the Coldheartedness scale to provide a more comprehensive assessment of psychopathic personality features than is provided by fearless dominance and impulsive antisociality alone.

Limitations and Future Directions

Though this study measured the two factors of PPI psychopathy in relation to a number of demographic, psychopathological, and personality variables, it is important to note that these results derive solely from self-report measures. Because of this, it seems likely that the correlations among the constructs studied here were inflated becuase of mono-method bias. We also did not assess psychopathy as measured by the PCL-R (Hare, 1991, 2003) or related clinical diagnostic instruments. It will be valuable in future studies to explicate how the factors of the PPI map onto (and diverge from) the constructs embodied in the two widely-studied factors of the PCL-R (Harpur et al., 1989) or the more recently advanced three- (Cooke & Michie, 2001) and four- (Hare, 2003) factor structures of psychopathy. This could be accomplished by admininstering these two instruments concurrently and comparing their respective relations with criterion variables. We also acknowledge that internal consistency levels were less than desirable for some of the NEO-PI-R facets, which may have limited our ability to detect effects for these facets and attenuated prediction of PPI factor scores at the facet level. We further note that though our double cross-validation results suggest that our regression equations will exhibit little validity shrinkage, it will be important to test this assumption in samples collected in wholly different samples than the one used in this study.

It is important to note that the factors of the PPI are uncorrelated—despite their common association with low Agreeableness—in contrast with the factors of other psychopathy measures such as the LSRP and PCL-R. This lack of intercorrelation raises questions as to what the central psychopathy construct is that the PPI measures. Inasmuch as the PPI factors both reflect elements of low Agreeableness, an alternative question might be what substantive psychopathy construct other psychopathy instruments measure above and beyond low Agreeableness. FFM findings in the current study highlight differences at the facet level of Agreeableness as well as at the domain and facet levels for Neuroticism, Extraversion, Openness, and Conscientiousness. Additionally, although this study included self-report markers of BIS/BAS activity, there were no laboratory tests administered to corroborate these self-report measures. Future research should endeavor to include measures of other kinds such as online affective response or neuropsychological tests alongside the PPI to explore possible divergences in emotional functioning between fearless dominance and impulsive antisociality (cf. Morgan & Lilienfeld, 2000).

Nonetheless, the current study replicated and extended in important ways the findings of Benning et al. (2003). The PPI appears to have two factors with divergent external correlates that can be predicted well by multiple inventories of normal-range personality dimensions. The results reported here provide further support for the PPI as a promising measure of two factors of psychopathy that have featured prominently in previous studies of the disorder. Furthermore, these results suggest an avenue by which researchers with data on normal-range personality can contribute to understanding of psychopathy—for example, investigators with extensive longitudinal or genetically informative databases that would provide for innovative investigations of the etiological bases of psychopathy. Studies of this kind, utilizing personality measures such as the NEO, MPQ (Benning, Patrick, Blonigen, et al., 2005), or MMPI (cf. Sellbom, Ben-Porath, Graham, Lilienfeld, & Patrick, 2005) to estimate psychopathy factor scores in existing data sets or to efficiently screen for participants high and low on these factors of psychopathy in new samples, will be invaluable in understanding the pathogenesis of psychopathy and constructing interventions to treat it.

Notes

1. As in Benning et al. (2003), when we performed an exploratory common factor analysis of all subscales of the PPI in the combined sample and all factors with an eigenvalue >1 were extracted, followed by varimax rotation, a three-factor solution emerged (eigenvalues 2.75, 1.79, and 1.13), accounting for 58.0% of the total covariance among PPI subscales. Because Coldheartedness formed a specific factor (loadings .14/.12/.93 on the first, second, and third factors, respectively; no scale loaded more than .31 on this factor), it was excluded from additional analyses, and the factor analysis was repeated. Two factors (eigenvalues 2.67 and 1.74), nearly identical to the first two factors in the previous analysis and accounting for 49.6% of the total covariance, were obtained. Machiavellian Egocentricity (loading .76 on the first factor/.12 on the second factor), Impulsive Nonconformity (.70/.36), Blame Externalization (.58/–.09), and Carefree Nonplanfulness (.53/–.05) had primary loadings on the first factor. Stress Immunity (–.39/.73), Fearlessness (.48/.65), and Social Potency (.07/.57) all had their primary loading on the second factor. Results were essentially identical using an oblique promax rotation. Factor congruence coefficients (Gorsuch, 1983) comparing these factors with those described in Benning et al. (2003) showed remarkable similarity between the factor structures in the two samples (.97 for fearless dominance and .99 for impulsive antisociality).

These results were confirmed with Procrustes rotations (which rotate a loading matrix to match a target loading matrix—in this case, the loading matrix reported in Benning et al., 2003). In the sample as a whole, the Procrustes-rotated factors had congruence coefficients of .98 for fearless dominance and .99 for impulsive antisociality when compared with the factors reported in Benning et al. (2003). Additionally, when these factor analyses were repeated separately in the prisoner and community samples, followed by a Procrustes rotation to the loading matrix in Benning et al. (2003), congruence coefficients for each factor ranged from .95 to .98, suggesting that in both subsamples, the factors were essentially identical to those reported in Benning et al. (2003).

2. None of the correlations were significant for the interaction of fearless dominance and impulsive antisociality with any of the variables in the Results section.

3. To assess the incremental validity of the factors of the PPI and the LSRP in predicting global psychopathy scores, we used regression analyses to examine the contributions of each instrument's factors to predicting Miller et al. (2001) psychopathy prototype scores. When the factors of the PPI and the LSRP were entered simultaneously into the regression ($R = .78$), PPI fearless dominance and impulsive antisociality (βs = .50 and .24, respectively) and LSRP primary psychopathy ($\beta = .33$) significantly predicted FFM psychopathy prototype scores (all ps $< .001$). However, the LSRP secondary psychopathy scale was not a significant predictor of FFM psychopathy prototype scores ($\beta = -.02$, $p > .75$). Hence, whereas both factors of the PPI have incremental validity in predicting global psychopathy scores, only LSRP primary psychopathy is an incrementally valid measure of psychopathic personality traits. Furthermore, when PPI factors and LSRP factors were entered into separate regression equations predicting FFM psychopathy prototype scores, the PPI factors predicted significantly more variance in FFM psychopathy prototype scores than did the LSRP factors, $F(2, 290) = 48.3$, $p < .001$.

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