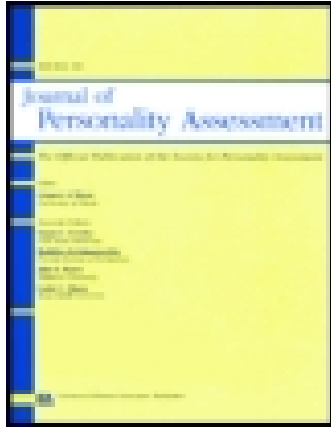


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Assessing Psychopathic Personality Traits With the MMPI–2

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In this study, we examined the utility of the MMPI–2 (Butcher et al., 2001) in assessing psychopathic personality traits. We explored whether MMPI–2 scales that measure affective and interpersonal traits add to the instrument’s social deviance measures in assessing global psychopathy and its two facets. Our study of 281 male and female college students indicates that the MMPI–2 Social Deviance scales (e.g., Clinical Scales 4 and 9, ASP) predict substantial variance in the social deviance factor and affiliated subscales of the Psychopathic Personality Inventory (PPI; Lilienfeld & Andrews, 1996), whereas MMPI–2 measures of affective and interpersonal functioning predict substantial variance in the affective-interpersonal PPI factor. In addition, the results of two regression models indicate that the Restructured Clinical scales provide the most parsimonious assessment of psychopathic personality traits.

Psychopathy is a characterological disorder marked by a constellation of behavioral, interpersonal, and affective characteristics. Hare and colleagues (e.g., Hare, Hart, & Harpur, 1991; Hart & Hare, 1997) have identified two primary facets (affective-interpersonal and social deviance) of psychopathy. Hare et al. (1991) described psychopaths behaviorally as sensation seeking, reckless, irresponsible, and impulsive. Interpersonally, psychopaths tend to be superficially charming, and they may view others as “objects” that exist for their own use (Hare, 1993). As a result, psychopaths tend to be manipulative, arrogant, narcissistic, and cold hearted (Hart & Hare, 1997). Affectively, psychopaths have a short temper, are unable to form close emotional ties with others, and lack remorse (Hare, 1996). Psychopaths are also deficient in emotions related to fear (Hare, 1966; Lykken, 1957). Research has demonstrated that individuals exhibiting affective and in-

terpersonal psychopathy traits show reduced evidence of negative emotional reactivity as indexed by fear-potentiated startle (Levenston, Patrick, Bradley, & Lang, 2000; Patrick, 1994).

The most extensively researched and validated instrument for assessing and diagnosing psychopathy is the Psychopathy Checklist–Revised (PCL–R; Hare, 1991, 2003). Many factor analyses indicate that the PCL–R items load on two correlated factors (e.g., Hare et al., 1990; Harpur, Hakstian, & Hare, 1988; but see Cooke & Michie, 2001, and Hare, 2003). The first factor contains items related to the affective-interpersonal facet of psychopathy such as callousness, manipulativeness, and grandiosity (Hare, 1991). The second factor contains items reflecting social deviance, such as early behavior problems, delinquency, impulsivity, irresponsibility, and aggressiveness (Hare, 1991). The PCL–R is a good

predictor of violent behavior (Hart & Hare, 1997; Serin, 1991), recidivism (Hart, Kropp, & Hare, 1988; Salekin, Rogers, & Sewell, 1996; Serin & Amos, 1995; Walters, 2003), and poor treatment response (Ogloff, Wong, & Greenwood, 1990; Rice, Harris, & Cormier, 1992).

Several researchers have been critical of the use of self-report measures in the assessment of psychopathy (e.g., Hare, 1985; Lilienfeld, 1994). One criticism is that psychopaths tend to be dishonest when responding to self-report measures as demonstrated by comparing their answers with collateral information (Hare, 1985). There is seldom strong agreement between psychopathy rating scales and self-report measures, and many self-report measures do not contain validity scales to detect response distortion (Hare, 1985; Harpur, Hare, & Hakstian, 1989; Lilienfeld, 1994).

However, a promising, recently introduced self-report measure of psychopathy is Lilienfeld and Andrews's (1996) Psychopathic Personality Inventory (PPI), which was designed to address these shortcomings. The PPI was developed primarily to detect psychopathic features in nonclinical (e.g., community, college student) populations. This is an important application, as recent research has shown that psychopathy appears to be a constellation of extreme levels of normal range personality traits (Lynam, 2002; Lynam & Widiger, 2001; Miller, Lynam, Widiger, & Leukefeld, 2001). Consequently, psychopathy research can be conducted fruitfully with nonclinical samples if appropriate measures are available. Moreover, the PPI includes eight subscales and four validity scales. The construct validity of the PPI has been demonstrated in both undergraduate and forensic samples (Chapman, Gremore, & Farmer, 2003; Edens, Poythress, & Lilienfeld, 1999; Lilienfeld & Andrews, 1996; Poythress, Edens, & Lilienfeld, 1998; Sandoval, Hancock, Poythress, Edens, & Lilienfeld, 2000).

Benning, Patrick, Hicks, Blonigen, and Krueger (2003) conducted an exploratory factor analysis of the PPI subscales and found that seven of the eight subscales loaded prominently on two separate factors that correspond to the affective-interpersonal (PPI-I) and social deviance (PPI-II) facets of psychopathy, whereas one subscale, Coldheartedness, did not load highly on either factor. Benning et al. (2003) identified a pattern of external correlates for the two PPI factors that broadly paralleled what has been reported in previous studies of the two primary PCL-R factors. PPI-I (Affective-Interpersonal) was positively correlated with traits reflecting positive emotionality (in particular, dominance and well-being) and negatively with traits reflecting negative emotionality (in particular, stress reactivity) and harm avoidance (fearlessness). This factor was not correlated with antisocial behavior, socioeconomic status (SES) variables, or substance abuse. PPI-II (Social Deviance), on the other hand, showed positive associations with antisocial behavior, SES variables, substance abuse, negative emotionality (particularly aggressiveness), and a negative association with traits reflecting constraint (behavioral inhibition).

Omnibus measures of personality and psychopathology also index certain characteristics associated with psychopathy. Among these, the Minnesota Multiphasic Personality Inventory-2 (MMPI-2; Butcher et al., 2001) is the most widely studied (Butcher & Rouse, 1996) and used (Camara, Nathan, & Puente, 2000). Traditionally, Clinical Scales 4 and 9 (especially the 4-9/9-4 code type) have been used to identify psychopathic personality characteristics based on evidence that scores on these scales are related to criminal behavior and antisocial personality disorder (Beall & Panton, 1956; Hathaway & Monachesi, 1953; Sutker & Moan, 1973; Walters, 1985). However, several authors (e.g., Hare, 1985) have been critical of using Clinical Scales 4 and 9 as measures of psychopathy, as these scales tend to correlate with Factor 2 (Social Deviance) of the PCL-R but not Factor 1 (Affective-Interpersonal; e.g., Harpur et al., 1989; see also Gynther, Altman, & Warbin, 1973, and Hawk & Peterson, 1974). However, these studies have focused exclusively on subscales of the MMPI (Hathaway & McKinley, 1943) and MMPI-2 that tap social deviance. The MMPI-2 contains several other scales that index grandiosity, interpersonal dominance, negative emotionality, fearfulness, and introversion. These scales, which are more likely to gauge the affective-interpersonal facet of psychopathy, have typically been ignored.

Two relatively new sets of MMPI-2 scales may also contribute to assessing psychopathy. The recently introduced MMPI-2 Restructured Clinical (RC) scales (Tellegen et al., 2003) were developed to improve the convergent and discriminant validity of the original Clinical scales. This goal was accomplished by removing (to the extent possible) items measuring a common affect-laden construct labeled *demoralization* and identifying the remaining distinctive core constructs measured by the Clinical scales (Tellegen et al., 2003). New scales were then constructed to assess these core factors. In comparison with the Clinical scales, the RC scales are more homogeneous and less intercorrelated, resulting in improved convergent and discriminant validity (Tellegen et al., 2003). Therefore, the restructured versions of Clinical Scales 4 and 9, Antisocial Behavior (RC4), and Hypomanic Activation (RC9), may be better candidates for measuring psychopathic personality traits and more specifically, the Social Deviance factor. Other MMPI-2 scales (in addition to the original and restructured versions of Scales 4 and 9) may also contribute to assessing psychopathy. For example, Lilienfeld (1996) found that in several college student samples, the Antisocial Practices (ASP) Content scale was a better measure of psychopathic characteristics than was Clinical Scale 4.

The Personality Psychopathology Five (PSY-5; Harkness, McNulty, & Ben-Porath, 1995) scales were developed based on a dimensional model of personality psychopathology. Several PSY-5 constructs may be relevant to understanding and measuring psychopathic personality traits. Aggressiveness (AGGR) is a measure of grandiosity,

interpersonal dominance, and instrumental aggression, whereas Disconstraint (DISC) is a measure of impulsivity and harm avoidance. Negative Emotionality/Neuroticism (NEGE) is a broad disposition to experience unpleasant emotions, and Introversion/Low Positive Emotionality (INTR) is a reversed measure of a broad disposition toward seeking out positive experiences, excitement seeking, social potency, and closeness. In addition, Clinical Scale 2, and more distinctly, RC2 (Low Positive Emotions) also index this broad domain (Sellbom & Ben-Porath, 2005). Thus, these MMPI-2 scales measure several characteristics tied to the psychopathic personality (Hare, 1991; Lilienfeld & Andrews, 1996; Lykken, 1995; Patrick, 1994).

Research has indicated that indexes of negative emotionality are inversely related to scores on the Affective-Interpersonal factor of the PCL-R (Hare, 1991; Harpur et al., 1989; Patrick, 1994; Verona, Patrick, & Joiner, 2001), which in part reflects callousness and emotional detachment. That is, psychopaths tend to report lower levels of fearfulness and anxiety (Lykken, 1957; Patrick, 1994). Several MMPI-2 scales that are related to fearfulness and negative emotionality—such as the Fears (FRS) Content scale; Clinical Scale 7 and its restructured version, Dysfunctional Negative Emotions (RC7); and the Neuroticism/Negative Emotionality (NEGE) PSY-5 scale—may be useful in the assessing psychopathic personality traits.

In this study, we had two goals. First, we sought to examine how well the aforementioned MMPI-2 scales could assess psychopathic personality traits, as measured by the PPI, in a nonclinical sample. We hypothesized that Scale 4, RC4, Scale 9, RC9, ASP, AGGR, and DISC would be associated with the social deviance facet of psychopathy (i.e., PPI-II) and with PPI subscales reflecting impulsivity/disinhibition and aggression such as Machiavellian Egocentricity, Impulsive Nonconformity, and Carefree Nonplanfulness. We expected that these MMPI-2 scales would show lower correlations with the affective-interpersonal facet of psychopathy (i.e., PPI-I) and its affiliated subscales such as Social Potency and Stress Immunity. Exceptions were AGGR and DISC, which also index such traits as dominance and grandiosity (AGGR) and fearlessness (DISC) and would therefore show associations with the Affective-Interpersonal factor as well. We predicted that MMPI-2 scales indexing fearfulness (FRS), negative emotionality (Scale 7, RC7, NEGE), and interpersonal inefficacy (Scale 2, RC2, INTR) would be negatively related to PPI-I and the PPI subscales comprising this factor but be positively correlated with PPI-II and its subscales (based on previous research findings; e.g., Benning et al., 2003; Patrick, 1994).

Our second goal was to examine traditional versus new MMPI-2 scales in assessing psychopathic personality. Because Scales 4 and 9 are traditionally used in measuring psychopathy, we tested how well affective and interpersonal MMPI-2 scales would predict beyond these scales in assessing psychopathy. We especially expected an increase in pre-

dition in the Affective-Interpersonal PPI factor. We tested two conceptually derived models. In the first, we examined whether the traditional Clinical scale measures of affective-interpersonal characteristics (Scales 2 and 7) would add to Scales 4 and 9 and whether the remaining affective and interpersonal MMPI-2 scales would add incrementally in the prediction of psychopathy and the two psychopathy factors. In the second model, we examined the new RC scales. In light of their greater distinctiveness (compared with the Clinical scales), we hypothesized that the RC scales would be more efficient in the measurement of psychopathic personality traits and require less augmentation by other MMPI-2 scales. Therefore, in the second model, we first examined the extent to which the affective and interpersonal RC scales (RC2 and RC7) add incrementally to the restructured versions of traditional MMPI psychopathy measures, RC4 and RC9, in the prediction of PPI scores. Next, we explored whether the remaining affective and interpersonal MMPI-2 scales would add incrementally beyond these four RC scales in the prediction of psychopathy and the two psychopathy factors.

METHOD

Participants

A total of 358 students enrolled in general psychology courses at a Midwestern university volunteered to participate in this study. To eliminate invalid test profiles, we employed the following exclusionary criteria for the MMPI-2: Cannot Say ≥ 30 and VRIN or TRIN $T \geq 80$. We also excluded participants who produced a PPI Cannot Say ≥ 10 or a PPI VRIN score 3 *SDs* from the mean. This procedure excluded 77 participants, leaving 141 male (50.2%) and 140 female (49.8%) students.^{1,2} The final sample ranged in age from 18 to 37 years ($M = 19.81$, $SD = 2.37$), and approximately 80% of the participants were under 21 years old. Most students were single/never married (95%). Although we did not inquire explicitly about race, the racial make up of the population from which this sample was drawn is primarily White. Excluded participants were significantly

¹This is a relatively large proportion (22%) of the study's potential participants. It may reflect the reality that college students participating in research are not always motivated to comply with the study's instructions. Excluding these participants may reduce the amount of error variance in the obtained results at the potential cost of a biased sample. In fact, a systematic examination of correlation coefficients for the overall sample indicated that some correlations would be reduced by .10, and some correlations would no longer reach statistical significance as determined by our Bonferroni correction. Although there were more men than women excluded, later regression analyses showed that gender did not moderate MMPI-2 scores' prediction of PPI scores.

²Means and standard deviations for MMPI-2 and PPI scales were similar to those found in other studies with college students (see Butcher, Graham, Dahlstrom, & Bowman, 1990; Hamburger, Lilienfeld, & Hogben, 1996).

more likely to be men (27%) than women (15%), $\chi^2(1, N = 358) = 7.32, p < .01$; effect size $r = .14$.

Measures

MMPI-2. We examined 14 MMPI-2 scales discussed earlier to evaluate their ability to assess the two facets of psychopathy. The MMPI-2 manual (Butcher et al., 2001) and RC scale monograph (Tellegen et al., 2003) provide extensive data regarding the psychometric characteristics of these scales in a variety of samples. For MMPI-2 scales used in this study, internal consistencies (Cronbach's α s) ranged from .59 (Scale 9) to .89 (Scale 7) for Clinical scales, from .70 (ASP) to .75 (FRS) for Content scales, from .49 (DISC) to .84 (NEGE) for PSY-5 scales, and .74 (RC4) to .84 (RC7) for RC scales.

PPI. The PPI (Lilienfeld & Andrews, 1996) is a 187-item, self-report inventory of psychopathy. Participants respond to each item on a 4-point Likert scale ranging from 1 (*false*) to 4 (*true*). The PPI yields a total score along with scores on eight subscales that were derived from an exploratory factor analysis using orthogonal rotation to minimize subscale overlap. Table 1 presents the names of these subscales along with a brief description. The PPI also contains four validity scales: Cannot Say, Variable Response Inconsistency (VRIN), Deviant Responding (DR), and Unlikely Virtues (UV). These scales are used to detect nonresponding, random or careless responding, overreporting, and underreporting, respectively.

In this study, we found an internal consistency (Cronbach's α) of .88 for the PPI total score, and internal consistencies for the PPI subscales ranged from .71 (Coldheartedness) to .83 (Social Potency). Following Benning et al. (2003), scores on the two factors of the PPI (I and II) were calculated by standardizing and then averaging scores for the PPI subscales that loaded preferentially on each factor.

Procedure

Participants completed the MMPI-2 and PPI in groups of up to 30. The order of administration of these two measures was counterbalanced. A transcript of the oral instructions was read to the students, which included a statement that they

were free to discontinue at any time without any prejudice and that they could skip any questions they did not wish to answer. Anonymity of responding was guaranteed. Each student signed a consent form prior to receiving the measures. At the end of the testing session, the students returned the test booklets and answer sheets and filled out a form required to award experimental points for class credit.

RESULTS

Gender Moderation Analyses

Given that scores on MMPI-2 scales may be interpreted differently for men and women and that the test has separate gender-based norms (Butcher et al., 2001), we first examined whether gender moderates the relation between PPI and MMPI-2 scores. Using moderated multiple regression procedures recommended by West, Aiken, and Krull (1996) and Lautenschlager and Mendoza (1986), we entered the MMPI-2 scale and Gender in the first block and the cross-product of Gender and the MMPI-2 scale in the second block in the prediction of PPI scores. A statistically significant increment in the multiple correlation in the second block would indicate a moderator effect.

We performed 42 sets of hierarchical regressions testing each of the 14 MMPI-2 scales in predicting the PPI total, PPI Factor 1, and PPI Factor 2 scores. The interaction was not significant in any of the 42 analyses. These findings indicated that gender did not moderate the MMPI-2 scores' prediction of PPI scores. As a consequence, all subsequent analyses were conducted with genders combined.

Zero-Order Correlations

We next examined the zero-order correlations between the 14 MMPI-2 scales of interest and the PPI total score, two factor scores, and eight subscales. Raw scores were used for all MMPI-2 and PPI scales. A modified Bonferroni correction for family-wise error was applied, and alpha was set at .005 (.05/11 for number of criterion measures). Table 2 displays correlations between the MMPI-2 scales and PPI total, factor, and subscale scores.

TABLE 1
Subscales of the Psychopathic Personality Inventory

<i>Subscale</i>	<i>No. of Items</i>	<i>Description</i>
Machiavellian Egocentricity	30	Ruthless, egocentric, and manipulative behavior in an interpersonal context
Social Potency	24	Influential and manipulative in social situations
Coldheartedness	21	Callous and lacks empathy, sentimentality, and guilt
Carefree Nonplanfulness	20	Failure to learn from consequences or to plan ahead
Fearlessness	19	Risk taking behavior without fear for potential harm
Blame Externalization	18	Blames others and rationalizes own wrongdoing
Impulsive Nonconformity	17	Reckless and rebellious behavior and lack of concern for social norms and values
Stress Immunity	11	Lack of emotional arousal in context of anxiety-provoking experiences

TABLE 2
Zero-Order Correlations Between MMPI-2 Scales and PPI Total Score, PPI Factor, and Subscales

PPI Scale	Social Deviance MMPI-2 Scales							Interpersonal and Affective MMPI-2 Scales						
	Scale 4	RC4	Scale 9	RC9	ASP	AGGR	DISC	Scale 2	RC2	INTR	Scale 7	RC7	NEGE	FRS
PPI total score	.31*	.52*	.46*	.44*	.43*	.42*	.55*	-.05	.03	-.02	-.14	.03	.06	-.11
PPI Factor 1														
(Affective-Interpersonal)	-.17*	.05	.12	.07	-.07	.22*	.31*	-.36*	-.38*	-.41*	-.38*	-.48*	-.48*	-.41*
Social Potency	-.16	.03	.09	.06	-.16	.24*	.14	-.30*	-.48*	-.51*	-.34*	-.37*	-.34*	-.15
Fearlessness	.08	.31*	.35*	.31*	.26*	.22*	.47*	-.18*	-.08	-.17*	-.02	-.12	-.12	-.33*
Stress Immunity	-.29*	-.15	-.18*	-.22*	-.25*	.02	.07	-.32*	-.26*	-.23*	-.47*	-.55*	-.60*	-.42*
PPI Factor 2 (Social Deviance)														
Deviance)	.50*	.56*	.48*	.48*	.52*	.33*	.44*	.21*	.29*	.23*	.45*	.37*	.41*	.15
Machiavellian Egocentricity	.33*	.43*	.38*	.48*	.54*	.36*	.39*	.12	.18	.15	.34*	.31*	.34*	.13
Carefree Nonplanfulness	.35*	.40*	.33*	.25*	.26*	.15	.24*	.16	.21*	.19*	.32*	.23*	.25*	.17
Blame Externalization	.51*	.41*	.36*	.37*	.40*	.22*	.24*	.30*	.31*	.25*	.48*	.48*	.51*	.26*
Impulsive Nonconformity	.35*	.47*	.37*	.34*	.38*	.27*	.46*	.07	.18*	.11	.24*	.12	.15	-.08
Coldheartedness	-.03	.15	.01	-.05	.13	.08	.15	-.12	.05	.13	-.18*	-.21*	-.20*	-.19*

Note. $N = 281$. MMPI-2 = Minnesota Multiphasic Personality Inventory-2; PPI = Psychopathic Personality Inventory; RC = Restructured Clinical Scale; RC4 = Antisocial Behavior; RC9 = Hypomanic Activation; ASP = Antisocial Practices; AGGR = Aggressiveness; DISC = Disconstraint; RC2 = Low Positive Emotions, INTR = Introversion/Low Positive Emotionality; RC7 = Dysfunctional Negative Emotions; NEGE = Neuroticism/Negative Emotionality; FRS = Fears.

* $p < .005$.

As evident from the left side of Table 2, the MMPI-2 Social Deviance scales exhibited significant and moderate to strong correlations with the PPI total score. Scale 4, RC4, Scale 9, RC9, and ASP were also significantly correlated with PPI-II but not PPI-I. Surprisingly, Scale 4 actually had a weak negative correlation with PPI-I. In most cases, these MMPI-2 measures exhibited significantly stronger correlations with the PPI-II than with PPI-I (Steiger's, 1980, t test for dependent correlations), $t(278) = 4.58-8.63$, $ps < .001$; $rs = .28$ to $.42$. The MMPI-2 Social Deviance indexes were generally most highly correlated with the PPI Impulsive Nonconformity, Machiavellian Egocentricity, Blame Externalization, and Carefree Nonplanfulness subscales. As predicted, AGGR was also related to PPI-I and more specifically, Social Potency and Fearlessness. DISC was moderately associated with both the Social Deviance factor and the Affective-Interpersonal factor, including a strong correlation with Fearlessness. Neither AGGR nor DISC exhibited a significant difference between their correlations with PPI-I and PPI-II; $t(278) = 1.38$, $p = .18$ and $t(278) = 1.68$, $p = .09$, respectively. None of the MMPI-2 Social Deviance scales exhibited significant positive correlations with PPI Coldheartedness or Stress Immunity. Thus, these MMPI-2 scales were generally associated with the PPI Social Deviance factor but not with the PPI's Affective-Interpersonal factor.

The MMPI-2 scales hypothesized to index interpersonal and affective characteristics of psychopathy were not significantly correlated with the PPI total score. As expected, the interpersonal and affective MMPI-2 scales in general displayed significant negative correlations with PPI-I but not with PPI-II. These differences were statistically significant; Steiger's (1980) $t(278) = 7.02-12.80$, $ps < .001$; $rs = .39$ to $.62$. However, the negative emotionality scales (e.g., Scale 7,

NEGE) but not FRS displayed positive moderate correlations with PPI-II and more specifically, with Machiavellian Egocentricity and Blame Externalization. This finding is consistent with previous findings that psychopathy traits tapping social deviance tend to be positively correlated with measures of anxiety and negative emotionality (Benning et al., 2003; Patrick, 1994). Unlike the MMPI-2 Social Deviance measures, RC2 and INTR (but not Scale 2) were strongly correlated with Social Potency. Furthermore, the anxiety-based MMPI-2 measures (i.e., Clinical Scale 7, RC7, and NEGE) demonstrated the highest negative correlations with PPI Coldheartedness and Stress Immunity. As expected, FRS was also negatively correlated with Fearlessness. As expected, few of the interpersonal or affective MMPI-2 scales were moderately correlated with Impulsive Nonconformity, Fearlessness, and Carefree Nonplanfulness, and many of these correlations failed to reach statistical significance.

Hierarchical Regression Analyses

Finally, we performed hierarchical regression analyses to test our two MMPI-2 models in predicting psychopathic personality traits. In the first regression, we entered Scales 4 and 9 simultaneously in the first block to account for all variance associated with these two scales; Clinical Scales 2 and 7 in the second block (stepwise entry; p for entry = $.05$, p for removal = $.10$); and AGGR, DISC, NEGE, INTR, RC2, RC7, and FRS in the final block (stepwise entry; p for entry = $.05$, p for removal = $.10$). We divided the sample into two random halves ($ns = 140$ and 141) and performed the regression analyses using data from the first random group. We then used the beta weights from that regression equation to generate a cross-validated multiple correlation in the second group. Next, we ran the same regression analysis in the second group and used these

beta weights to cross-validate the equation in the first group. Finally, we calculated an average cross-validated multiple *R* for each PPI variable predicted. Table 3 shows the results of the first set of regression analyses. An examination of the cross-validated multiple *R*s indicates that the Affective and Interpersonal scales add to Clinical Scales 4 and 9 in the prediction of psychopathic personality traits. However, the traditional Clinical Scales 2 and 7 did not add to Scales 4 and 9, with the exception of Scale 7 for predicting PPI-I scores. Noteworthy is that Scale 7 was no longer a significant predictor after the other affective-Interpersonal MMPI-2 scales were entered into the model. As expected, the increment is largest in predicting the PPI Affective-Interpersonal factor (average cross-validated multiple *R* increased from .24 to .62). The smallest increment was in the prediction on the PPI Social Deviance factor (average cross-validated multiple *R* increased only by .02). Overall, the average cross-validated *R* values (all significant) were .59 for the PPI total score, .62 for PPI-I, and .60 for PPI-II. Thus, on cross-validation, the MMPI-2 scales accounted for 35% to 38% of the variance in PPI total and factor scores. Finally, an examination of the MMPI-2 predictors that emerged in both random halves revealed that the DISC scale added consistently to assessing psychopathy in general and social deviance in particular, whereas AGGR, NEGE (reversed), and INTR (reversed) were stable predictors of affective and interpersonal psychopathy traits.

In the second set of hierarchical regressions, we focused on whether the set of MMPI-2 scales measuring affective-interpersonal relevant domains would add incrementally to the restructured versions of Clinical Scales 4 and 9 in predicting psychopathic personality traits. Here, RC4 and RC9 were

simultaneously entered in the first block. The affective and interpersonal RC Scales (RC2 and RC7) were entered in the second block (stepwise entry; *p* for entry = .05, *p* for removal = .10), and the remaining affective-interpersonal MMPI-2 scales were entered in the third block (stepwise entry; *p* for entry = .05, *p* for removal = .10). We used the same cross-validation methodology. Table 4 depicts the results of these regression analyses. As expected, an examination of the cross-validated *R*s revealed that RC7 and in some instances RC2 added a significant increment in predicting PPI scores. However, only one other MMPI-2 scale (NEGE) added incrementally above the RC scales in the prediction of PPI-I scores. Overall, the average cross-validated *R* values (all significant) were .61 for the PPI total score, .63 for PPI-I, and .66 for PPI-II. Thus, on cross-validation, the RC Scales accounted for 37% to 44% of the variance in PPI total and factor scores. Because the RC scale model included fewer scales (usually only RC4, RC7, and RC9), it provided a more efficient prediction. The RC scales predicted more variance in PPI scores than did the Clinical scales alone (cross-validated multiple *R*s were .08 to .12 higher), and these scales also predicted equivalent to increased amounts of variance in PPI scores when compared with the full first model using Clinical, Content, and PSY-5 scales.

DISCUSSION

We examined the extent to which a broad set of MMPI-2 scales can predict normal range personality traits linked to psychopathy. Our results indicate that MMPI-2 scales are ef-

TABLE 3
Hierarchical Regressions Predicting PPI Total, PPI-I, and PPI-II Scores in Two Random Halves

<i>PPI Scores</i>	<i>Group 2</i>		<i>Group 1</i>		<i>Average Cross-Validation R</i>	<i>Predictors in Both Regressions</i>		
	<i>Random Group 1 R</i>	<i>Cross-Validated R</i>	<i>Random Group 1 Predictors^a</i>	<i>Cross-Validated R</i>			<i>Random Group 2 Predictors^a</i>	
PPI total								
Block 1	.46	.49	4 (+), 9 (+)	.49	.46	4 (+), 9 (+)	.48	4, 9
Block 2	.46	.49	None entered	.56	.48	Scale 7 (-) ^b	.49	None
Block 3	.56	.64	DISC (+), FRS (+)	.72	.54	DISC (+), NEGE (-), AGGR (+)	.59	DISC
PPI-I								
Block 1	.25	.27	4 (-), 9 (+)	.30	.21	4 (-), 9 (+)	.24	4, 9
Block 2	.55	.48	Scale 7 (-) ^b	.51	.50	Scale 7 (-) ^b	.49	Scale 7 ^b
Block 3	.69	.58	AGGR (+), NEGE (-), INTR (+), RC7 (-)	.71	.65	AGGR (+), NEGE (-), INTR (-), FRS (-)	.62	AGGR, NEGE, INTR
PPI-II								
Block 1	.57	.59	4 (+), 9 (+)	.59	.57	4 (+), 9 (+)	.58	4, 9
Block 2	.60	.56	Scale 7 (+) ^b	.59	.57	None entered	.57	None
Block 3	.67	.60	DISC (+), INTR (+)	.63	.60	DISC (+)	.60	DISC

Note. *N*s = 140 (Group 1) and 141 (Group 2). Blocks 2 and 3 include the scales that add significantly to the scales entered in the previous blocks. All *R* values are cumulative. PPI = Psychopathic Personality Inventory; PPI-I = Affective-Interpersonal; PPI-II = Social Deviance; DISC = Disconstraint; FRS = Fears; NEGE = Neuroticism/Negative Emotionality; AGGR = Aggressiveness; INTR = Introversive/Low Positive Emotionality; RC = Restructured Clinical Scale; RC7 = Dysfunctional Negative Emotions.

^aSigns in parentheses denote direction of beta weights for each scale entered. ^bDoes not have a significant beta weight in the final model.

TABLE 4
Hierarchical Regressions Predicting PPI Total, PPI-I, and PPI-II Scores in Two Random Halves

<i>PPI Scores</i>	<i>Random Group 1 R</i>	<i>Group 2 Cross-Validated R</i>	<i>Random Group 1 Predictors^a</i>	<i>Random Group 2 R</i>	<i>Group 1 Cross-Validated R</i>	<i>Random Group 2 Predictors^a</i>	<i>Average Cross-Validation R</i>	<i>Predictors in Both Regressions</i>
PPI total								
Block 1	.56	.56	RC4 (+), RC9 (+)	.57	.56	RC4 (+), RC9 (+)	.56	RC4, RC9
Block 2	.59	.63	RC7 (-)	.65	.58	RC7 (-)	.61	RC7
Block 3	.63	.62	INTR (+)	.69	.55	NEGE (-), DISC (+)	.59	None
PPI-I								
Block 1	.06	.00	RC4 (+), RC9 (+)	.14	-.01	RC4 (+), RC9 (+)	.00	RC4, RC9
Block 2	.64	.58	RC2 (-), RC7 (-)	.60	.60	RC7 (-)	.59	RC7
Block 3	.66	.63	NEGE (-)	.66	.63	NEGE (-), FRS (-)	.63	NEGE
PPI-II								
Block 1	.62	.60	RC4 (+), RC9 (+)	.61	.62	RC4 (+), RC9 (+)	.61	RC4, RC9
Block 2	.68	.63	RC2 (+)	.64	.68	RC2 (+)	.66	RC2 (+)
Block 3	.72	.59	INTR (+)	.64	.68	None entered	.64	None

Note. $N_s = 140$ (Group 1) and 141 (Group 2). Blocks 2 and 3 include the scales that add significantly to the scales entered in the previous blocks. All R values are cumulative. PPI = Psychopathic Personality Inventory; PPI-I = Affective-Interpersonal; PPI-II = Social Deviance; RC = Restructured Clinical Scale; RC4 = Antisocial Behavior; RC9 = Hypomanic Activation; INTR = Introversion/Low Positive Emotionality; NEGE = Neuroticism/Negative Emotionality; DISC = Disconstraint; RC2 = Low Positive Emotions; RC7 = Dysfunctional Negative Emotions; FRS = Fears.

^aSigns in parentheses denote direction of beta weights for each scale entered.

fective predictors of scores on the PPI, a well-validated, self-report measure of psychopathy designed to assess this condition in nonclinical samples. In particular, the MMPI-2 Social Deviance scales best captured PPI-II and trait-specific PPI subscales assessing antisocial behavior, impulsivity, aggressiveness, poor planning, nonconformity, and the propensity to externalize blame. In contrast, MMPI-2 scales (negatively) related to negative emotionality, fearfulness, and sociability were the best predictors of scores on the PPI Affective-Interpersonal factor and its constituent subscales, which reflect low reactivity to stressful situations, lack of anticipatory fear, and social dominance and manipulativeness. Thus, whereas the traditional MMPI-2 scales of social deviance do not fully capture all aspects of psychopathic personality, other MMPI-2 scales can aid incrementally in the assessment of these traits.

Five MMPI-2 scales (Clinical Scales 4 and 9, RC4, RC9, and ASP) appeared to be directly related to social deviance but not the affective-interpersonal traits of psychopathy. Scores on these scales do not provide specific information about the etiology of an individual's social deviance and are therefore not sufficient for discriminating psychopathic personality from other important contributors to social deviance. It is therefore necessary to examine other MMPI-2 scales to obtain this information. Thus, elevation on social deviance scales coupled with scores on scales that tap the Affective-Interpersonal psychopathy factor, such as low scores on negative emotionality scales (RC7, NEGE) or reversed positive emotionality scales (RC2, INTR), may indicate the presence of psychopathic personality traits. Another scale, FRS, appears to be a homogeneous measure of fearfulness and is valuable in capturing the fearlessness traits of psychopathy above and beyond other MMPI-2 scales.

The most parsimonious assessment of the psychopathic personality with the MMPI-2 may be accomplished with the RC scales. RC4 and RC9 were optimal predictors of social deviance, as elevations on these scales coupled with low scores on RC7 and RC2 indicate the presence of affective-interpersonal traits associated with psychopathy. These four scales accounted for nearly all the PPI variance predicted by the MMPI-2. The improved construct validity of the RC scales was reflected by the finding that RC4 and RC9 did not contribute to the measurement of PPI-I (to which they are unrelated); only RC7 and NEGE did.

Our results are in line with previous findings that have demonstrated that affective and interpersonal psychopathy traits are inversely related to physiological and self-report measures of fearfulness (Lykken, 1957, 1995) and negative emotionality (Harpur et al., 1989; Patrick, 1994). Thus, individuals who score high on this psychopathy factor do not experience normal fear or anxiety. Moreover, individuals who score highly on the PPI's Affective-Interpersonal factor tend to be extraverted and score highly on measures of positive emotionality (Benning et al., 2003). Researchers have also found that individuals who score high on the Social Deviance factor tend to score highly on measures of negative emotionality and low on measures of well-being and constraint (Benning et al., 2003; Patrick, 1994; Sher & Trull, 1994), which is consistent with our findings. These general findings (here and elsewhere) should caution researchers from viewing psychopathy as a homogeneous construct but rather as a heterogeneous entity with several potential underpinnings. Thus, researchers and clinicians should be cautioned against using the MMPI-2 to solely predict global psychopathy but instead focus on predicting its facets.

From a practical standpoint, these results suggest that patterns of MMPI-2 scores can be used to explore the nature of

an individual's social deviance. Some people who engage in violent behavior possess psychopathic personality traits, such as callousness, grandiosity, and fearlessness, and presumably engage in such conduct because they care little about others. Others are impulsive and experience considerable anger, anxiety, and distress and may commit violent acts as a reaction to negative emotions, which are sometimes referred to as "crimes of passion." Indeed, the distinction between primary and secondary psychopathy (including so-called neurotic psychopathy) has long been noted in the psychopathy literature (Karpman, 1947; Lykken, 1995). Thus, the phenotypes of violent and antisocial behavior are similar, but their personological origins may be quite different and may be distinguished based on their MMPI-2 scale scores. For example, consider an individual who engages in antisocial behavior who scores high on Clinical Scales 4 and 9 (or their restructured versions), AGGR, and DISC and low on NEGE and INTR (or RC7 and RC2). This person, who is sociable and possesses considerable positive emotionality, may engage in antisocial conduct with little anxiety or anticipatory fear. Conversely, if a person scores highly on Clinical Scale 4 (or RC4) and ASP and does not score low on the interpersonal and affectivity scales (or even higher than average on NEGE and INTR), this individual may engage in antisocial behavior that is largely reactive. Consistent with this perspective, a recent effort to identify PCL-R psychopathy subtypes on the basis of personality structure (Hicks, Markon, Patrick, Krueger, & Newman, 2004) revealed two distinct subtypes: one marked by personality traits associated with PPI-I (in particular, low stress reactivity and high dominance) and the other marked by personality traits associated with PPI-II (in particular, high negative emotionality and low constraint). Findings further supportive of this position could signal a need for distinct interventions for antisocial individuals with differing personality profiles.

Several methodological limitations temper our findings and conclusions. First, we used college students who likely do not possess the full range of psychopathic traits. However, as mentioned earlier, previous research has indicated that psychopathic personality features represent extreme variants of normal range personality that can be detected in college students (Lynam, 2002; Miller & Lynam, 2003; Miller et al., 2001). Indeed, recent findings that used taxometric analyses indicate that the PPI is underpinned by a latent dimension rather a taxon (Marcus, Johns, & Edens, 2004), suggesting that PPI-assessed psychopathy differs in degree, not in kind, from normality. Moreover, the PPI was designed explicitly for use in nonclinical samples and was developed and initially validated in college samples (Lilienfeld & Andrews, 1996). In addition, Lilienfeld (1996) argued that undergraduate samples are appropriate for studying psychopathy because many college students possess high levels of psychopathic traits and because they are relatively free from disabling mood, anxiety, and organic brain syndromes, which can contaminate scores on psychopathy measures. For

example, depression and anxiety can lead to state-trait artifacts, the tendency of changes in mood to influence self-ratings on stable traits. Such artifacts were found to influence scores on self-report measures of antisocial personality disorder (Trull & Goodwin, 1993). Nevertheless, further research should examine these MMPI-2 correlates of psychopathy in other settings.

Another limitation is that we compared responses on two different self-report inventories and did not use any other mode of assessment such as clinical ratings or historical information. Therefore, concerns could be raised that the results of this monomethod study may not generalize to other measures. Although shared method variance is a potential problem, relying on self-report measures as quasi-criteria is commonplace and appropriate in construct validation.

In light of these limitations, future research should aim at examining the MMPI-2's association with the two psychopathic facets in forensic and correctional settings to ascertain our findings' generalizability. Another important direction is to develop MMPI-2-estimated PPI factors using beta weights obtained from regression equations and to validate these estimated factors with external criteria. This approach has been particularly successful with the Multidimensional Personality Questionnaire (Tellegen, in press) estimating the two PPI factors indexing the two psychopathy factors (Benning, Patrick, Blonigen, Hicks, & Iacono, 2005; Blonigen, Hicks, Krueger, Patrick, & Iacono, 2005) using the regression weights from Benning et al. (2003). Future research should also explore these MMPI-2 scales' ability to predict scores on other (nonquestionnaire) psychopathy measures such as the PCL-R. This research could determine whether a similar pattern of MMPI-2 scales is associated with the two PCL-R factors as we have found with the PPI factors. Finally, based on a series of confirmatory factor analyses, Cooke and Michie (2001) concluded that a three-factor model of the PCL-R may be more appropriate than a two-factor model. This model divides Factor 1 into two factors: one affective, the other interpersonal. More recently, Hare (2003) proposed a four-factor structure underlying the PCL-R. He suggested that the two original factors serve as higher order factors, each containing two nested subfactors. According to this model, PCL-R F1 contains one subfactor indexing affective traits and another subfactor indexing interpersonal traits, whereas PCL-R F2 contains an antisocial lifestyle subfactor and an impulsive behavior subfactor. It would be informative to explore relations between these hypothesized three- and four-factor structures and the MMPI-2.

In summary, the MMPI-2 appears to hold promise in the assessment of both the affective-interpersonal and social deviance facets of psychopathy. These findings are important considering the extensive use of the MMPI-2 in forensic and correctional settings (Borum & Grisso, 1995), as clinicians could use the test to screen for psychopathic personality traits, especially when administration of more time-consuming and labor-intensive instruments is not feasible.

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