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Scott R. Ross  
*DePauw University*

Catherine J. Lutz  
*University of Dayton, czois1@udayton.edu*

Steven E. Bailey

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Running Head: PSYCHOPATHIC ATTRIBUTES AND THE FIVE FACTOR MODEL

Psychopathy and the Five Factor Model in a Noninstitutionalized Sample:

A Domain and Facet Level Analysis

Scott R. Ross<sup>1</sup>, Catherine J. Lutz<sup>2</sup>, Steven E. Bailey<sup>3</sup>

DePauw University<sup>1</sup>, University of Dayton<sup>2</sup>,

University of Texas – Houston Health Sciences Center<sup>3</sup>

Address all correspondence to Scott R. Ross; Department of Psychology; DePauw University;  
Greencastle, IN 46135.

## Abstract

The current study examined the relationship of the Five Factor Model (FFM) of personality to primary and secondary psychopathic dispositions in a noninstitutionalized sample. Previous investigations suggest that Agreeableness, Conscientiousness, and Neuroticism are basic personality traits that characterize psychopathy. However, few studies have examined the relationship of the FFM to primary and secondary psychopathic attributes, respectively. In the current study, the relationship of the FFM using the NEO-PI-R to primary and secondary psychopathic dispositions was investigated in a sample of young adults. Previous findings were extended by (1) addressing the relationship of higher and lower order FFM traits (i.e., facet scales) to primary and secondary psychopathy in a subclinical sample and (2) examining sex differences in FFM traits in relation to these two psychopathic dispositions. Although a number of differences were found between men and women for the FFM in terms of primary psychopathy, few sex differences were noted with respect to secondary psychopathy. In addition, examination of facet scale relationships to primary and secondary psychopathy further clarify the role of the FFM in psychopathy. These findings lend further support to the use of domain and facet scales of the NEO-PI-R in the identification of personality pathology in noninstitutionalized populations.

**Keywords:** Psychopathy, Five-Factor Model, Personality, Sex Differences

## Psychopathy and the Five Factor Model in a Noninstitutionalized Population:

### A Domain and Facet Level Analysis

The Five Factor Model (FFM) has recently emerged as a model for describing the basic traits comprising normal personality (Costa & McCrae, 1988a, 1988b; Digman & Takemoto-Chock, 1981; Goldberg, 1982, 1990). Although different investigators have variously referred to the “Big-Five” personality traits, they include Neuroticism – Emotional Stability, Extraversion – Introversion, Openness – Closedness to Experience, Agreeableness – Antagonism, and Conscientiousness – Undirectedness (Costa & McCrae, 1992). In addition, proponents of the FFM argue that this model is useful in describing personality disorder as well as normal variations in trait dispositions (Costa & Widiger, 1994). A number of studies have already been conducted in an attempt to locate personality disorders as defined in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; APA, 1994) and their symptoms in the FFM (Blais, 1997; Cloninger & Svrakic, 1994; Coolidge, Becker, DiRito, Durham, Kinlaw, & Philbrick, 1994; Costa & McCrae, 1990; Dyce, 1997; Hyer, Brawell, Albrecht, Boyd, Boudewyns, & Talbert, 1994; Trull, 1992; Trull, Widiger, & Burr, 2001; Wiggins & Pincus, 1989; Yeung et al., 1993). However, fewer investigations have focused on personality pathology not explicit in the DSM-IV.

One such example is psychopathy as originally described by Cleckley (1941). Although the term has historically referred to an entire class of “diseases of the mind,” contemporary conceptualizations of psychopathy based on Cleckley’s observations paint a specific profile of dispositions that typify the construct. He suggests that psychopaths are marked by emotional callousness, irritability, impulsivity, manipulation, charisma and social charm. Empirical investigations of psychopathic offenders suggest that they are among the most prolific and violent of criminals, committing a wider variety and number of crimes than the average criminal (Hare & Jutai,

1983; Hare & McPherson, 1984; Hare, McPherson, & Forth, 1988; Kosson, Smith, & Newman, 1990). Though not synonymous with psychopathy, this theoretical construct is thought to underlie the diagnosis of antisocial personality disorder (ASPD) as defined in the DSM (Cloninger, 1978; Spitzer, Endicott, & Robins, 1975). Specifically, ASPD is thought to correspond most closely to the observable behavioral components of psychopathy such as repeated arrests, frequent lying, and failure to maintain consistent employment (Hare, Hart, & Harpur, 1991; Hare & Hart, 1995; Millon, 1981). In contrast, the concept of psychopathy, more broadly defined, emphasizes both antisocial behaviors, as well as characteristic traits such as a superficial charm, grandiose sense of self-worth, and a fundamental inability to empathize with the feelings of others (Hare, 1991; Harpur, Hakstian, & Hare, 1988).

Many have advocated a two-factor model of psychopathy earlier described by Karpman (1941) and later by Blackburn (1975). Karpman (1941) characterized primary psychopaths as callous, calculating, manipulative, and deceitful. Secondary psychopaths, on the other hand, are thought to suffer from some type of neurotic disorder that stimulates impulsive behavior. Because primary psychopaths are thought to be relatively free of depression and anxiety, they are more likely to be successful in their antisocial acts, and therefore, often escape punishment. Using MMPI profiles of violent offenders, Blackburn (1975) characterized primary psychopaths as aggressive, impulsive, and undersocialized with secondary psychopaths exhibiting these qualities in addition to social introversion and guilt-proneness. In line with this conceptual distinction, it has been argued that ASPD largely represents characteristics of secondary psychopathy (Levenson, Kiehl, & Fitzpatrick, 1995). Though controversial, many investigators have noted that the distinction between primary and secondary psychopathy is gaining increased empirical support (Eysenck, 1994; Gudjonsson, 1983; Lewis, 1991; Lykken, 1995; Mealey, 1995; Pollock, 1999; Wales, 1995). However, clarifying the

differences in these constructs has been slow. Recent exceptions to this trend include Lilienfeld and Hess (2001) and Ross and Rausch (2001) who have reported notable differences between primary and secondary psychopathy in relation to somatization and achievement orientation, respectively.

Hare's (1985) Psychopathy Checklist (PCL), and its revised form the PCL-R (Hare, 1991), is the most widely used measure of psychopathy, with a number of studies strongly supporting the reliability and validity of the PCL-R. In addition, factor analysis of the PCL-R suggests that it measures aspects of both primary and secondary psychopathy (Levenson, et al., 1995). Hare and colleagues (Hare, 1991; Harpur, et al., 1988) characterize factor 1 as reflecting the core personality traits of psychopathy and factor 2 as reflecting social deviance. The first factor of the PCL-R, which most closely approximates primary psychopathy, includes features such as callousness, an inclination to lie, lack of remorse, and manipulativeness. The second factor of the PCL-R, which most closely maps onto secondary psychopathy, includes impulsivity, boredom susceptibility, early behavior problems and delinquency. It should be noted, however, that although the two-factor model has amassed a good deal of empirical support (Cooke, 1995; Harpur, et al, 1988; Hobson & Shine, 1998, Kosson et al, 1990), researchers have recently begun to question the viability of this model (Cooke & Michie, 2001; Widiger & Lyman, 1998). Specifically, critics argue that a two-factor model in which factor 2 is thought to reflect socially deviant behaviors rather than personality traits is simplistic, pointing out that factor 2 also consists of personality traits such as impulsivity and sensation-seeking (Widiger & Lyman, 1998). In line with these criticisms, a series of seven studies by Cooke and Michie (2001) using both North American and Scottish samples suggests that a three-factor model (i.e., Arrogant and Deceitful Interpersonal Style, Deficient Affective Experience, and Impulsive and Irresponsible Behavioral Style) may more accurately capture the data.

### Limitations of Previous Studies

Although the PCL-R is the predominant means of assessing psychopathy, most studies utilizing the PCL have been conducted using older, incarcerated adults in which the base-rate of psychopathy is high. Additionally, men have been the subject of psychopathy research in all but a few studies, where the manifestation of psychopathy in women has been of less interest (see Forth, Brown, Hart, & Hare, 1996; and, Salekin, Rogers, & Sewell, 1997, for reviews). This approach to sampling and participant inclusion may pose some difficulties for making generalizations about the construct of psychopathy, more broadly defined. In an effort to be more inclusive, there has been a recent redirection of focus to subclinical manifestations of psychopathy (Lilienfeld, 1994, 1998). Specifically, investigators are beginning to study “successful psychopaths”—those who may engage in criminal activity but elude detection. By definition, this subgroup of psychopaths is excluded when examining only incarcerated populations. Consistent with this approach, instruments for the measurement of psychopathic attributes in noninstitutionalized samples have been developed by Hart (1992, as cited in Forth et al., 1996), Levenson, Kiehl, and Fitzpatrick (1995), and Lilienfeld and Andrews (1996). Although Lilienfeld and Andrews have focused on numerous trait dispositions that comprise psychopathy, Levenson et al. (1995) emphasize the distinction between primary and secondary psychopathy. Initial validation studies by Levenson et al. indicate that their scales significantly predict reports of antisocial behavior and are positively related to boredom susceptibility and disinhibition in college samples. Further, only secondary psychopathy was related to anxiety, and in the positive direction, which is consistent with findings by Harpur, Hare, and Hakstian (1989) for factor 1 and factor 2 of the PCL. Finally, in two additional studies, Lynam, Whiteside, and Jones

(1999) further support the validity of these scales vis-a'-vis related self-report and behavioral measures.

### The Five Factor Model and Psychopathy

In terms of the FFM, Widiger and Lynam (1998) hypothesize that Agreeableness and Conscientiousness are primary traits that describe global psychopathy. They suggest that the first factor of the PCL-R corresponds to low Agreeableness whereas the second factor more closely approximates low Agreeableness and low Conscientiousness. To a lesser degree, they also implicate the role of Neuroticism in discriminating between the two factor types where lower levels of Neuroticism characterize factor 1 and higher levels of Neuroticism characterize factor 2. This contention is supported by Harpur et al. (1989) who found that anxiety as measured by the STAI and Neuroticism as measured by the Eysenck Personality Questionnaire (EPQ) are negatively related to factor 1 scores and positively related to factor 2 on the PCL. In a further investigation, Harpur et al. (1994) examined the relationship between the NEO-PI-R and PCL scores in separate samples of 28 inmates and 47 students. Although PCL total scores were negatively related to Agreeableness and Conscientiousness in inmates, the PCL was related to only Agreeableness in the student sample. Negligible correlations were noted between the other factors of Neuroticism, Extraversion, and Openness to Experience. Using a relatively smaller sample of 12 inmates and 12 students, Hart and Hare (1994) found partial support for these findings using the Big Five version of the Interpersonal Adjective Scales. When samples were combined, they found significant relationships between the PCL – Screening Version (PCL: SV) and most Five Factor traits. Extraversion was positively related whereas Agreeableness, Conscientiousness, Openness, and Neuroticism were negatively related to composite PCL: SV scores. Although the correlations ranged between .44 and .83, they were likely inflated by combining different samples. Finally, a recent study by Lynam et al. (1999) examined the



relationship between FFM traits as measured by the Big Five Inventory (BFI) and primary and secondary psychopathic attributes as measured by Levenson et al.'s (1995) scales in a student population. They found that primary psychopathy was negatively related to Extraversion, Agreeableness and Conscientiousness. Secondary psychopathy was negatively related to Extraversion, Agreeableness, and Conscientiousness as well, but also demonstrated a positive relationship to Neuroticism. Lynam et al.'s findings for Neuroticism, Agreeableness, and Conscientiousness and psychopathy are all in keeping with prior research. However, a negative relationship of Extraversion to primary psychopathy is unexpected.

Although examination of the relationship between factor 1 and factor 2 of the PCL and FFM traits may be quite fruitful, others have argued that an examination of lower-order traits may be especially useful when making differential diagnoses regarding character pathology (Costa & Widiger, 1994). However, few studies have reported relationships between FFM facets and psychopathy (Harpur et al., 1994; Miller, Lynam, Widiger, & Leukefeld, 2001). In an investigation of NEO-PI facets of Neuroticism, Extraversion, and Openness in a student sample ( $N = 47$ ), Harpur et al. (1994) found only a significant relationship in the positive direction for Ideas from the Openness domain. For an inmate sample ( $N = 28$ ), significant relationships in the positive direction were found for Hostility and Excitement-Seeking with PCL total scores. However, Impulsiveness in addition to Hostility were positively related whereas Values was negatively related to factor 2 scores. No other significant relationships between facet scales and the PCL were noted for either sample. However, their lack of positive findings for FFM facets likely reflects lower statistical power in their study.

Other investigators have offered additional hypotheses regarding the relationships between facets of Agreeableness and Conscientiousness to PCL factors. Based on a review of response modulation deficits in psychopathy, Widiger and Lynam (1998) suggest that psychopathy may also be

characterized by lower levels of Deliberation and Self-Discipline on the NEO-PI-R. Given that many studies of the response modulation hypothesis have focused on low-anxious psychopaths, this hypothesis may be most applicable to primary psychopathy. Moreover, semantic aphasia as originally hypothesized by Cleckley (1941) and later supported by Williamson, Harpur, and Hare (1991) may suggest that psychopathic individuals lack an empathic understanding or appreciation for feelings not unlike alexithymics. Finally, Widiger and Lynam suggest that previous findings regarding social information processing deficits implicate the importance of Straightforwardness (reversely, as manipulation), Compliance (reversely, as aggression), and Trust (reversely, as mistrust) as important facets describing the psychopathic personality.

Miller et al. (2001) tested predictions made by Widiger and Lynam (1998) regarding facet scale elevations. They began by mailing a questionnaire containing bipolar adjective sets representing each of the facets of the FFM to experts in the field of psychopathy. Experts were to rate the degree to which each item was characteristic of the "prototypic psychopath." Based on these responses, the authors developed a prototypic psychopathy profile that represented the mean ratings across experts for each item. A large sample of male and female participants then completed the NEO-PI-R. Intra-class correlations were computed between the psychopathy profile and the NEO-PI-R for each subject separately. This resulted in an index (the Psychopathy Resemblance Index) that represented the degree of correspondence between the participant's standing on each of the facets and the "prototypic psychopath." Finally, zero-order correlations were computed between the Psychopathy Resemblance Index (PRI) and the NEO-PI-R scores. Results were generally consistent with predictions made by Widiger and Lynam (1998). For male participants, positive relationships were found between the PRI and the neuroticism facets of angry hostility and impulsivity. Conversely, negative relationships were found between the PRI and anxiety, depression, self-

consciousness, and vulnerability. Negative relationships were found between the PRI and all facets of agreeableness. With respect to the extraversion facets, positive relationships were found between gregariousness, assertiveness, activity, and excitement seeking. Finally, male participants who were more likely to resemble psychopaths were less likely to be high in the conscientiousness facets of dutifulness and deliberation. Although Miller et al.'s (2001) measure of psychopathy is extremely intriguing, one potential limitation of their findings is that they did not differentiate between primary and secondary psychopathy. As noted earlier, primary and secondary psychopaths may differ in their patterns of elevations on conscientiousness and neuroticism.

### Sex Differences in Psychopathy

Another issue of relevance is the construct validity of psychopathy across sexes. In general, research designed to understand criminal behavior has been slower to develop (Giordano & Cernkovich, 1997). It has been assumed that criminal behavior in women is governed less by personality predispositions (Steffensmeier & Allan, 1995) and more by contextual forces (e.g., pressure to please a lover). Likewise, feminist scholars have assumed that female criminal behavior often reflects a reaction to male violence and control, as may be the case when a woman aggresses against an abusive lover (Chesney-Lind & Shelden, 1992). Despite the relative dearth of research in the area of psychopathy in women, a few reliable sex differences have been identified. Specifically, women demonstrate a later average age of onset of socially deviant behavior and show fewer signs of overt aggression (Silverthorn & Frick, 1997). Additionally, there are some indications the female psychopaths are more likely to possess comorbid diagnoses of histrionic personality disorder (Lilienfeld, Van Valkenburg, Larntz, & Akiskal, 1986; Salekin et al., 1997) or mood disruption such as anxiety and depression (Mulder, Wells, Joyce, & Bushnell, 1994).

Although a recent study by Lynam et al. (1999) found that the two-factor structure of the Levenson (1995) scales was virtually identical across male and female college students, Salekin et al. (1997) suggested that the latent structure of psychopathy as measured by the PCL-R may differ between men and women. Further, in a smaller sample of 150 college students, Forth et al. (1996) failed to confirm the two factor structure of psychopathy using the PCL-R: SV in a mixed sex sample. Three other studies (Neary, 1990; Rutherford, Cacciola, Alterman, & McKay, 1996; Zagon & Jackson, 1994) in addition to Forth et al. who examined the psychopathy construct in women also found lower psychopathy scores for women, suggesting that the construct may not be as salient for women.

To the authors' knowledge, Miller et al. (2001) is one of the only studies that has explicitly examined sex differences in the relationship between psychopathy and the FFM. The results revealed that the pattern of relationships between psychopathy and the domains and facets of the NEO-PI-R were remarkably similar for men and women. However, a few interesting and potentially important differences were revealed. Female participants demonstrated weaker positive relationships between psychopathy and activity. This is consistent with the contention the female psychopaths have a later age of onset of socially deviant behavior and are less likely to commit violent crimes (Silverthorn & Frick, 1997). Female participants also demonstrated stronger negative associations between psychopathy and conscientiousness than did the male participants in their sample. Further, stronger associations between psychopathy and the conscientiousness facets of order and discipline were also revealed. These findings in conjunction with findings from other studies indicating that female psychopaths are more likely to possess co-morbid diagnoses of histrionic personality disorder or neurotic disorders (Lilienfeld, et al., 1986; Mulder et al., 1994; Salekin et al., 1997) may suggest that

female psychopaths more closely resemble male secondary psychopaths than male primary psychopaths.

### Current Study

Instruments like those of the Levenson (1995) scales has afforded researchers the opportunity to investigate the relationship between the FFM and psychopathy in a subclinical sample of young adults. Although the descriptive ability of the FFM to capture personality pathology has drawn increased attention and support, Miller, et al. (2001) note that “the few studies available on the relation of psychopathy to the FFM are supportive, but not without their problems” (p. 258). Previous findings were extended by (1) addressing the relationship of higher and lower order FFM traits (i.e., facet scales) to primary and secondary psychopathy, and (2) examining sex differences in FFM traits in relation to these two psychopathic dispositions. This is an important consideration as Salekin et al. (1997) reported findings indicating that the two-factor conceptualization of the PCL-R, reflecting the distinction between primary and secondary psychopathy, may not equally apply to men and women. Moreover, consistent with growing interest in subclinical manifestations of psychopathy, young adults were included from a normal college population. Finally, measures of response bias were utilized to exclude potentially invalid cases. As pointed out by Lynam et al. (1999), “...self-report scales are susceptible to malingering, or socially desirable responding that may be particularly problematic for a group that is defined in part by lying and deceit” (p. 112).

The following hypotheses with regards to differences between primary and secondary psychopathy in the NEO-PI-R are offered:

H 1: Consistent with predictions made by Widiger and Lynam (1998), it is hypothesized that whereas both primary and secondary psychopathy will be negatively related to many of the facets of agreeableness, only secondary psychopathy will be negatively related to the facets of conscientiousness.

H 2: There will be a positive relationship between and primary psychopathy and the angry hostility facet of neuroticism. Conversely, there will be positive relationships between secondary psychopathy and the other five facets of neuroticism (i.e., anxiety, depression, vulnerability, self-consciousness, and impulsivity).

H 3: We hypothesize that there will be a significant Sex x Trait interactions in the prediction of primary psychopathy by the NEO-PI-R facet scales, but not in the prediction of secondary psychopathy. Such an interactions would suggest that whereas the pattern of relationships between secondary psychopathy and the FFM is similar across sexes, male and female primary psychopaths significantly differ from each other in their standing on the FFM.

### Method

#### Participants and Procedure:

The study sample ( $N = 476$ ) included male (30.7%) and female (68.5%) participants who had been recruited from introductory psychology classes over four semesters from 1994 through 1996 at a university in Ontario, Canada. The average age was 20.1 ( $SD = 3.4$ ). Participants' racial composition was White (80.8), Black (6.9), Asian (7.4), or other (4.9).

Participants were ran in small group of 5 to 25 per session. All participants completed the Psychopathic Attributes Scales, the Revised NEO Personality Inventory (form S of the NEO-PI-R; Costa & McCrae, 1992), and measures of symptom over-reporting and defensiveness. Order of the measures was counterbalanced using a Latin Squares design.

## Measures

### Psychopathic Attributes

Primary Psychopathy Scale (Levenson et al., 1995) consists of 16 items measuring an inclination to lie, lack of remorse, callousness, and manipulateness, e.g., “For me, what’s right is whatever I can get away with.” (agree) or “I enjoy manipulating other people’s feelings” (agree). Coefficient alpha in for the current sample was .85.

Secondary Psychopathy Scale (Levenson et al., 1995) consists of 10 items measuring impulsivity, intolerance of frustration, quick-temperedness, and lack of long-term goals, e.g., “I find myself in the same kinds of trouble, time after time” (agree) or “I have been in a lot of shouting matches with other people” (agree). Coefficient alpha in for the current sample was .62.

### Five Factor Model.

Revised NEO Personality Inventory (NEO-PI-R; Costa & McCrae, 1992) was used to assess the FFM personality traits of neuroticism, extraversion, openness, agreeableness, and conscientiousness. The NEO-PI-R consists of 240 items that measures these five basic personality domains. Coefficient alphas for the five domains in the current sample ranged from .86 (Conscientiousness) to .91 (Neuroticism). In addition, each factor 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 alphas for the facet scales ranged from .52 (Openness to Values) to .81 (Openness to Aesthetics)

### Response Bias.

The F (Infrequency), K (Correction), and L (Lie) scales of the MMPI-2 (Butcher, Dahlstrom, Graham, Tellegen, & Kaemmer, 1989) were used to assess potential response biases in this sample. Coefficient alphas were for these scales in the current sample were .80, .61, and .42 respectively.

### Results

In order to minimize the potential effect of response bias in this study, persons with extreme scores on MMPI-2 L, F, or K scales were excluded from further analyses. Based on suggestions by Butcher, Graham, and Ben-Porath (1995) for the use of MMPI-2 validity scales as screening measures in psychological research, cases obtaining scores that were greater than or equal to 120 T on the F scale, or greater than or equal to 80 T on either the L or K scales were excluded from further analyses. This resulted in a final sample of 463 cases.

Zero-order correlations revealed that primary and secondary psychopathic dispositions were significantly correlated in both the male ( $r = .39, p < .001$ ) and female ( $r = .46, p < .001$ ) samples. Overall rates of endorsement of primary psychopathic attributes were higher in men ( $M = 35.54; Sd = 6.99$ ) than in women ( $M = 30.91; Sd = 6.98; t(2, 461) = 6.58, p < .001$ ). However, no differences in endorsement rates for secondary psychopathy were noted between men ( $M = 21.99; Sd = 3.83$ ) and women ( $M = 21.86; Sd = 4.12; t(2, 461) = .31, p > .05$ ). Correlations between NEO-PI-R domain and facet scales and primary and secondary psychopathic attributes for male and female samples, respectively, are presented in Table 1. Openness and Agreeableness were significantly negatively correlated with primary psychopathy in men whereas only Agreeableness was significantly negatively correlated with primary psychopathy in women. In contrast, Neuroticism, Agreeableness, and Conscientiousness were significantly related to secondary psychopathy in both men and women. As predicted, more differences between the correlations for men and women were found with respect to primary psychopathy than to secondary psychopathy. Specifically, in terms of primary psychopathy,



significant differences between the correlations for men and women were found for the Agreeableness domain as well as for eight facet scales as assessed by comparing  $r$  to  $z$  transformed values (see Table 1). In contrast, in terms of secondary psychopathy no significant differences between the correlations for men and women were found for the domains and only one difference was found for facets.

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 insert Table 1 about here  
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In order to determine the non-redundant relationships of the five factors to primary and secondary psychopathic dispositions and to test for possible sex differences, two hierarchical multiple regressions with simultaneous entry were computed with either primary or secondary psychopathy as the criterion. In both equations, sex and the five factors were entered in the first step and the five Sex x Trait interactions were entered in the second step. The FFM significantly predicted both primary (Adj.  $R^2 = .58$ ,  $p < .001$ ) and secondary (Adj.  $R^2 = .50$ ,  $p < .001$ ) psychopathic attributes.

Primary psychopathy was significantly predicted by Extraversion (+), Openness (-), Agreeableness (-), Conscientiousness (-), and sex (see Table 2). In terms of sex differences, the result failed to reveal a significant  $R^2$  change value on the second step ( $R^2\Delta = .01$ ,  $p > .05$ ), suggesting that there were no significant sex differences in the associations between the FFM and primary psychopathy. In contrast to the results for primary psychopathy, Neuroticism (+), Agreeableness (-), and Conscientiousness (-) significantly predicted secondary psychopathy (see Table 3), which is consistent with bivariate correlations reported in Table 1. Consistent with predictions, the results revealed a non-significant  $R^2$  change value on the second step ( $R^2\Delta = .01$ ,  $p > .05$ ), indicating that there were no significant sex differences in the associations between the FFM and secondary

psychopathy. Follow-up diagnostics for each regression model revealed no multivariate outliers, points of influence, or multicollinearity among predictor variables as indicated by tolerances and variance inflation values within normal limits (see Tabachnik & Fidell, 1996).

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insert Table 2 and 3 about here

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Given these findings for domain scales of the NEO-PI-R in the prediction of psychopathic dispositions, the facet scale contributors to standing on the FFM were examined. Step-wise multiple regressions were first computed with either primary or secondary psychopathy as the criterion. These analyses were conducted for each gender separately to avoid obscuring possible sex differences in the significant facet predictors of psychopathy (that is, if a facet scale was a predictor for only one gender but the analyses were computed for the entire sample, computing a step-wise regression would lead that facet to be falsely discarded). In order to reduce the number of variables, only facets that demonstrated significant zero-order correlations with primary or secondary psychopathy respectively for either men or women were included. Hierarchical multiple regression equations with simultaneous entry using the entire sample were then computed with primary or secondary psychopathy as the criterion. Facets that were significant in the stepwise regressions for either gender were entered along with sex in the first step, and the Sex x Facet interactions were entered on the second step.

Table 4 and 5 show the results of the hierarchical multiple regressions for primary and secondary psychopathy, respectively. As one can see from Table 4, there were no Neuroticism facets that significantly predicted primary psychopathy, and Excitement-Seeking was the only Extraversion facet that significantly predicted primary psychopathy. Openness to Feelings and Openness to Ideas

were negatively related to primary psychopathy. Finally, with the exception of Compliance and Tender-Mindedness, all Agreeableness facets negatively predicted primary psychopathy. Consistent with hypotheses, there were significant sex differences in facet scale predictors as indicated by the significant  $R^2$  change of the second step ( $R^2\Delta = .02, p < .05$ ). Specifically, there was a significant Sex x Tender-Mindedness interaction.

As can be seen in Table 5, the Neuroticism facets of Hostility, Depression, and Impulsivity were significant predictors of secondary psychopathy. The Agreeableness facets of Trust, Altruism, and Modesty were significant negative predictors of secondary psychopathy. Finally, the Conscientiousness facets of Competence, Order, and Deliberation were significant, negative predictors of secondary psychopathy. There were no significant sex differences in facet scale predictors, as indicated by the non-significant  $R^2$  change value of the second step ( $R^2\Delta = .01, p > .05$ ).

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insert Table 4 and 5 about here

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### Discussion

The FFM as embodied by the NEO-PI-R accounted for roughly 40% of the variance in both primary and secondary psychopathic dispositions as measured by the Levenson et al. (1995) scales. Nonetheless, the Levenson subscales demonstrated notably different patterns of relationships with FFM traits, as expected. Consistent with Widiger and Lynam's (1998) predictions for factor 1 and factor 2 of the PCL-R, and Lynam et al.'s (1999) findings for the Levenson scales and the FFM, Agreeableness was a strong marker of primary psychopathy across sexes. Multivariate analyses of facet scales for Agreeableness indicated that primary psychopathy is characterized by mistrust, dishonesty, manipulation, and arrogance across both men and women. In addition, hard-mindedness

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contributed more to standing in men than it did in women for primary psychopathy.

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Conscientiousness and Openness were also predictors of primary psychopathy in both men and women. The facet of Ideas and Feeling negatively predicted primary psychopathy across the entire sample. The findings for Conscientiousness were inconsistent with the hypothesis that this trait

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would only be associated with secondary psychopathy. However, it should be noted that the magnitude of the relations between Conscientiousness and primary psychopathy are much smaller (-  
.11) than those found between Conscientiousness and secondary psychopathy (-.41). It is likely that

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the significant findings with respect to primary psychopathy can largely be accounted for by the large sample size. More generally, because of the large sample size of the current study, more emphasis should be placed on the magnitude of effect sizes than on statistical significance. Lastly, Extraversion

was important in describing primary psychopathy, but, Neuroticism was not Consistent with earlier reports by Harpur et al. (1994), the facet scale of Excitement-Seeking was positively related to primary psychopathy in men. Regression analyses of the facet scales failed to reveal any facets of Neuroticism that were significant predictors of primary psychopathy.

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In terms of secondary psychopathy, Neuroticism and Conscientiousness were found to be strong markers of this construct, consistent with earlier findings by Lynam et al. (1999) and hypotheses by Widiger and Lynam (1998). Across sexes, secondary psychopathy was related to a tendency to experience anger and depression, and act without future planning or concern for the consequences of one's behavior. These results are consistent with Widiger and Lynam's (1998) predictions based on PCL criteria reflecting factor 2 and previous findings by Lynam et al. and Harpur et al. (1989). In contrast, the role of Neuroticism in primary psychopathy was non-remarkable. These results are consistent with those of Lynam et al. who used the BFI to assess FFM factor traits. They suggested that the absence of a relationship between Neuroticism and the Levenson primary

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psychopathy subscale may be a measurement limitation of the Levenson scales and has been a criticism of the PCL-R, as well. Nonetheless, the corresponding factor (1) of the PCL has been shown to be negatively related to neuroticism and anxiety (Harpur et al., 1989). Consequently, an alternative explanation for the absence of a relationship between Neuroticism and primary psychopathy is that it may be an indicator of adequate levels of Neuroticism in subclinical manifestations of primary psychopathy. A number of theories, including Gray (1987) and Fowles (1987, 1988) neurophysiological model of personality, would predict that Neuroticism moderates the relationship between psychopathy and criminally overt behavior leading to incarceration. According to Lykken (1995), Gray's model predicts that antisocial behavior results when the behavioral inhibition system (embodied in the FFM as Neuroticism) is too weak. Although Lykken points out that there is strong support for this model, further investigation of the role of Neuroticism in subclinical populations merits attention.

As noted above, comparison of the regression analyses revealed sex differences in relations between the NEO-PI-R facet scales and primary psychopathy. Generally, these findings are consistent with contentions by Salekin et al. (1997) and Forth et al. (1996) that the construct validity for the distinction between primary (PCL-R factor 1) and secondary (PCL-R factor 2) psychopathy may be lower for women compared to men. It is also interesting to note that the overlap between primary and secondary psychopathy in women was almost twice as much as for men. In keeping with findings by Salekin et al., these results suggest that further examination of these constructs in women is warranted and a necessary step in fully understanding the construct of psychopathy. On the other hand, secondary psychopathy exhibited notable similarities across sexes. Contrary to hypotheses, regression analyses of the domain scales did not reveal a significant Sex x Trait interaction in the prediction of primary psychopathy. One possible explanation for the apparent inconsistency in findings between the

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zero-order correlations and the regression analysis is that in the multivariate analysis the significant main effect for Sex overrode the Sex x Trait interaction. That is, the difference between men and women in average scores on primary psychopathy overshadowed the potential sex differences in relations between primary psychopathy and the FFM.

In summary, this is one of the first explorations of the importance of FFM facet-level traits in the prediction of type-specific dimensions underlying personality pathology. Exceptions to this trend include recent studies by Miller et al. (2001), Reynolds and Clark (2001), and Trull, Widiger, and Burr (2001) examining the role of FFM facet level traits in personality pathology. In particular, these findings suggest that the examination of NEO-PI-R facet scales adds predictive power over a simply domain level of analysis. Although not specifically reported in the results, it was found that the proportions of variance accounted for by facet scales, within a specific domain, to the prediction of primary and secondary psychopathy was comparable to the proportions of variance accounted for when using all domain scales collectively to predict standing. *Further, the fact that in some cases facet scales within a domain demonstrated the opposite pattern of relationships with primary psychopathy (Anxiety versus Angry Hostility for women) underscores the importance of examining the relationship between psychopathy and the FFM at the facet level. In such instances, merely examining the domain scales might be misleading in that the effects for the facets cancel each other out, as was the case in the relationship between primary psychopathy and Neuroticism among women in this sample. This portion is no longer relevant.*

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Within the construct of psychopathy, these findings also implicate stronger validity for secondary psychopathy, in comparison to primary psychopathy, across sexes. Although primary and secondary psychopathy were more highly correlated in women than men, the variance in the FFM accounting for primary and secondary constructs was highly comparable across sexes. However, the

role that institutionalization plays in the validity of these constructs has yet to be fully explicated. Nonetheless, these findings strongly support the use of the NEO-PI-R in the evaluation of psychopathy in subclinical manifestations of the disorder. Such an evaluation could take a similar form as that used in Miller et al. (2001) of examining the correspondence between a given individual's NEO-PI-R profile and that of expert ratings of the "prototypic psychopath." This methodology could be expanded by eliciting experts' ratings of prototypes for both primary and secondary psychopathy. Alternatively, one could compare individual profiles with that of psychopathy FFM profiles generated by meta-analyses of effect sizes across studies that have been conducted to date in this area.

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Table 1

NEO-PI-R Domain and Facet Scale Correlations with Primary and Secondary Psychopathy in Men ( $n = 142$ ) and Women ( $n = 321$ )

NEO-PI-R Domain or Facet	Primary Psychopathy			Secondary Psychopathy		
	Men	Women	t	Men	Women	t
Neuroticism	.08	.01	0.7	.55***	.46***	0.9
Anxiety	-.00	-.16**	1.6	.27***	.15*	0.8
Angry Hostility	.33***	.33***	0	.50***	.51***	0.1
Depression	-.05	-.08	0.3	.40***	.37***	0.3
Self-Consciousness	-.03	-.11	0.8	.35***	.18***	1.7
Impulsiveness	.11	.09	0.2	.49***	.40***	0.9
Vulnerability	.03	-.03	0.6	.39***	.33***	0.6
Extraversion	.13	.01	1.2	-.16	-.08	0.8
Warmth	-.17	-.34***	1.7	-.18	-.26***	0.8
Gregariousness	-.16	-.01	1.5	-.01	.04	0.5
Assertiveness	-.19	.22***	4.1*	-.13	-.04	0.9
Activity	-.10	.10	2.0	-.13	-.04	0.9
Excitement-Seeking	.33***	.18***	1.5	.04	.18***	1.4
Positive emotions	-.11	-.14*	0.3	-.23**	-.30***	0.7
Openness	-.22*	-.06	1.6	.07	-.06	0.7
Fantasy	-.08	.09	1.7	.26**	.09	1.7
Aesthetics	-.25**	-.07	1.8	-.04	-.07	0.3
Feelings	-.23**	-.12	1.1	-.03	-.12	0.9
Actions	-.16	.05	2.1*	-.023	.05	0.73
Ideas	-.10	-.16**	0.6	-.01	-.16**	1.5
Values	-.01	.01	0.2	.09	.01	0.8
Agreeableness	-.67***	-.44***	2.3*	-.28***	-.44***	1.6
Trust	-.35***	-.35***	0	-.27***	-.35***	0.8
Straightforwardness	-.58***	-.34***	2.4*	-.24**	-.34***	1.0
Altruism	-.45***	-.39***	0.6	-.28***	-.39***	1.1
Compliance	-.44***	-.41***	0.3	-.29***	-.41***	1.2
Modesty	-.47***	-.13	3.4*	-.09	-.13	0.4
Tender-Mindedness	-.48***	-.16**	3.2*	-.01	-.16**	1.5
Conscientiousness	-.12	-.05	0.7	-.54***	-.51***	0.3
Competence	-.08	-.06	0.2	-.43***	-.36***	0.7
Order	-.05	.05	1.0	-.31***	-.27***	0.4
Dutifulness	-.16	-.20***	0.4	-.40***	-.39***	0.1
Achievement-Striving	-.12	.10	1.2	-.44***	-.23***	2.1*
Self-Discipline	-.14	.07	2.1*	-.48***	-.42***	0.6
Deliberation	-.10	-.21***	1.1	-.39***	-.51***	1.2

Note. NEO-PI-R = Revised NEO Personality Inventory. \* $p < .01$ . \*\* $p < .005$ . \*\*\* $p < .001$ .



<sup>1</sup>Bonferroni's correction for multiple comparisons =  $p < .001$

Table 2

Hierarchical Multiple Regression with Simultaneous Entry Predicting Primary Psychopathy from the NEO PI-R Domains and Gender

Variable	$\beta$	t	Sig.	$R^2\Delta$	Sig.
Step 1					
Neuroticism	-.05	-1.29	.20	.58	.00
Extraversion	.08	2.40	.02		
Openness	-.12	-3.79	.00		
Agreeableness	-.68	-21.52	.00		
Conscientiousness	-.11	-3.20	.00		
Gender	-.14	-4.17	.00		
Step 2					
G x N	-.38	-1.60	.11	.01	.20
G x E	-.39	-1.52	.13		
G x O	.08	.31	.75		
G x A	-.33	-1.41	.16		
G x C	.17	.71	.48		

Note.  $R^2 = .58$  for step 1;  $R^2 = .59$  for step 2.

Table 3

Hierarchical Multiple Regression with Simultaneous Entry Predicting Secondary Psychopathy from the NEO PI-R Domains and Gender

Variable	$\beta$	t	Sig.	$R^2\Delta$	Sig.
Step 1					
Neuroticism	.32	8.31	.00	.50	.00
Extraversion	.03	.90	.37		
Openness	-.03	-.83	.41		
Agreeableness	-.37	-10.64	.00		
Conscientiousness	-.41	-11.49	.00		
Gender	.03	.92	.36		
Step 2					
G x N	-.07	-.29	.77	.01	.11
G x E	.35	1.25	.21		
G x O	-.26	-1.01	.31		
G x A	-.51	-2.11	.04		
G x C	-.35	-1.33	.19		

Note.  $R^2 = .50$  for step 1;  $R^2 = .51$  for step 2.

Table 4

Hierarchical Multiple Regression with Simultaneous Entry Predicting Primary Psychopathy from the NEO PI-R Facets and Gender

Variable	$\beta$	t	Sig.	$R^2\Delta$	Sig.
Step 1					
Anxiety (N1)	-.04	-1.38	.17	.64	.00
Excitement-Seeking (E5)	.19	6.14	.00		
Feelings (O3)	-.21	-6.15	.00		
Ideas (O5)	-.06	-2.08	.04		
Trust (A1)	-.12	-3.74	.00		
Straightforwardness (A2)	-.35	-9.17	.00		
Altruism (A3)	-.17	-4.54	.00		
Modesty (A5)	-.20	-5.74	.00		
Tender-Mindedness (A6)	-.05	-1.64	.10		
Deliberation (C6)	-.04	-1.45	.15		
Gender	-.10	-3.18	.00		
Step 2					
G x N1	-.22	-1.27	.21	.02	.03

G x E5	-.22	-1.07	.29
G x O3	-.35	-1.53	.13
G x O5	.28	-1.83	.07
G x A1	-.29	-1.51	.13
G x A2	-.21	-.91	.36
G x A3	.08	.29	.77
G x A5	.02	.13	.90
G x A6	.48	2.16	.03
G x C6	.30	1.70	.09

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*Note.*  $R^2 = .64$  for step 1;  $R^2 = .66$  for step 2.

Table 5

Hierarchical Multiple Regression with Simultaneous Entry Predicting Secondary Psychopathy from the NEO PI-R Facets and Gender

Variable	$\beta$	t	Sig.	R <sup>2</sup> $\Delta$	Sig.
Step 1					
Hostility (N2)	.22	5.04	.00	.56	.00
Depression (N3)	.16	4.15	.00		
Impulsivity (N5)	.08	2.00	.05		
Excitement-Seeking (E5)	.05	1.50	.13		
Trust (A1)	-.13	-3.39	.00		
Altruism (A3)	-.12	-2.97	.00		
Modesty (A4)	-.12	-2.69	.00		
Competence (C1)	-.13	-3.11	.00		
Order (C2)	-.13	-3.52	.00		
Dutifulness (C4)	-.07	-1.80	.08		
Deliberation (C6)	-.23	-5.64	.00		
Gender	.03	.94	.35		
Step 2					
G x N2	-.14	-.60	.55	.01	.58
G x N3	-.01	-.07	.94		
G x N5	-.36	-1.56	.12		
G x E5	.22	.95	.35		

G x A1	-.08	-.35	.72
G x A3	-.11	-.39	.70
G x A4	-.10	-.43	.67
G x C1	-.33	-1.21	.23
G x C2	-.25	-1.25	.21
G x C4	.40	1.52	.13
G x C6	-.26	-1.09	.28

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*Note.*  $R^2 = .56$  for step 1;  $R^2 = .57$  for step 2.



