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## Psychopathy in women: Structural modeling and comorbidity

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### 1. Introduction

The concept of psychopathy has elicited attention and scientific study from the medical and psychiatric communities for over two hundred years. In 1801 Philip Pinel identified a pathological condition of the emotions, “mania sans delirè,” which he described as being characterized by emotional lability and social instability. The same condition acquired alternative names by French, English, and German writers including moral insanity (Prichard, 1835), delinquente nato (Lombroso, 1876), psychopathic inferiority (Koch, 1891), psychopathic personalities (Kraepelin, 1904), sociopathy (Partridge, 1930), and semantic dementia (Cleckley, 1941). Schneider (1923) identified two types of psychopathic individuals: that is, the Gemütsamer psychopath or the smug, arrogant psychopath who primarily causes suffering to others, and the Geltungsbedürftig or the needy, demanding psychopath who experiences internal suffering from their psychic abnormality (Herpertz & Sass, 2000).

Since that time, the etiology of this and other personality disorders (PDs) has been explored from a variety of perspectives with a common consensus developing which recognizes an interaction of influences including genetic predispositions (DiLalla, Gottesman, & Carey, 2000), psychophysiological processes (Dolan, 1999; Lapiere, Braun, Hodgins, &

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Toupin, 1995; Raine et al., 1994), developmental influences (Cloninger, Reich, & Guze, 1975; Marshall & Cooke, 1999), and situational conditions (Loeber & Stouthamer-Loeber, 1986). The predictive and structural integrity of the construct has also attracted vigorous research attention since the creation of the Psychopathy Checklist (PCL) by Hare (1980), the Psychopathy Checklist-Revised (PCL-R) in 1991, and Psychopathy Checklist: Screening Version (PCL-R: SV) by Hart, Cox, and Hare (1995). Based on Cleckley's (1941) articulate clinical description of the condition, these empirical instruments have been found to demonstrate a robust ability to predict reoffense rates (Hare, McPherson, & Forth, 1988), institutional adjustment (Gacano, Meloy, Sheppard, Speth, & Roske, 1995), treatment response (Ogloff, Wong, & Greenwood, 1990; Rice, Harris, & Cormier, 1992), and community violence among prisoners (Hare & McPherson, 1984), forensic patients (Rice & Harris, 1992), and civilly committed psychiatric patients (Douglas, Ogloff, Nicholls, & Grant, 1999; Monahan et al., 2001). The strength and consistency of these findings have resulted in an enthusiastic response by professionals performing risk assessments for violence, institutional security, and community management within both the psychiatric and correctional communities.

In the present study, we examine the gender issues that emerge when exploring the performance and structure of psychopathy in women. Using a sample of 138 incarcerated female inmates, we examine seven structural models and the comorbidity of psychopathy with the 10 PDs. Our goal is to determine similarities and differences in the construct as it applies to women and men, and to contribute to the emergent research that is seeking to understand the personality dimensions of this widely recognized construct.

### *1.1. Factor structure of psychopathy*

Over the past 15 years, research efforts to explore psychopathy's underlying structure and to demonstrate across samples its ability to predict violence and recidivism have involved primarily, if not exclusively, male samples of prison inmates and forensic patients. The structural inquiries began with the original analyses by Harpur, Hakstian, and Hare (1988), who used a split-half cross validation method to explore data collected across six samples of incarcerated and forensically hospitalized males ( $N=1119$ ). Based on the analyses of congruence coefficients, they concluded that psychopathy was composed of two factors that encompassed 20 of the 22 items that were contained in the instrument at that time. The first factor, which came to be known as the Interpersonal/Affective factor, was found to include core personality traits including superficiality, habitual lying and manipulation; callousness; and a lack of affect, guilt, and remorse. The second factor termed Social Deviance was characterized by a chronically unstable and antisocial lifestyle.

Since the formulation of this model, it has been replicated nationally and internationally (Cooke, 1995; Pham, Remy, Dailliet, & Leinard, 1998; Côte & Hodgins, 1989; Hobson & Shine, 1998) and has been applied to adolescents (Murrie & Cornell, 2000; Brandt, Kennedy, Patrick, & Curtin, 1997), community samples (Livesley, Jackson, & Schroeder, 1992), and to groups obtained from twin registries (Livesley & Schroeder, 1991). Monahan et al.'s (2001) large-scale study examined the risk for violence among discharged civilly committed

psychiatric patients and found that scores on the Social Deviance dimension predicted violence among this group upon return to the community, even when 15 covariates were entered into the predictive equation (including criminal and violence history, substance abuse and diagnoses, other PDs, anger, and demographic characteristics). Structural modeling of these data, however, suggested that the two-factor model provided only an adequate fit to the data, leading Skeem and Mulvey (2001) to conclude that the marginal goodness-of-fit measures may have been due to the low base rate of psychopathy in this sample and/or structural differences in the PCL: SV when applied to civil psychiatric samples.

Cooke and Michie (2001) have been the most explicit in their study of the structure of psychopathy and began their inquiry based on the observation that the original Harpur et al. (1988) analyses were flawed by the misrepresentations of the congruence coefficients. Using a combination of eight Canadian and two American samples ( $N=2067$ ), they applied confirmatory factor analyses (CFAs) to the data and further concluded that the two-factor model did not meet acceptable standards of congruence using various goodness-of-fit measures.

Cooke and Michie (2001) have subsequently sought to develop a more precise model of psychopathy using theoretical premises based on personality theory in general and psychopathy in particular combined with newer statistical techniques designed to explore the dimensional structure of the construct. The theoretical inquiry led them to define three congruent aspects of personality: (a) affective, interpersonal, and behavioral domains; (b) a hierarchical structure of personality constructs; and (c) the assumption of continuity between normal personality traits and PDs (Widiger, 1998). The statistical analyses used the direct oblimin criterion for obtaining an oblique rotation within exploratory factor analysis (EFA), combined with the application of item response theory (IRT) to create item “testlets” and cluster analysis to determine the optimal agglomerate of the paired items. These analyses converged on a three-factor model composed of 13 items, which included six testlets. The first factor, termed Arrogant and Deceitful Interpersonal Style, was made up of two testlets including glibness and grandiose sense of self-worth combined with pathological lying and conning/manipulative. The second factor, labeled Deficient Affective Experience, was composed of two testlets, shallow affect and callous/lack of empathy, and lack of remorse/guilt and failure to accept responsibility. The third factor, referred to as Impulsive and Irresponsible Behavioral Style, was made up of two testlets: the first, a need for stimulation/proneness to boredom, impulsivity, and irresponsibility; and the second, parasitic lifestyle and lack of realistic long-term goals. This model was found to result in a fit that was superior to that achieved with the two-factor model and appeared congruent with a hierarchical model subsumed within a coherent construct.

Cross validation of the three-factor model has included replication on a Scottish sample of 247 prisoners; analyses of data using the screening version of the PCL-R, the PCL-SV; and, an examination of convergent validity using the DSM-IV diagnostic criteria for antisocial PD. The diagnostic validation, which used 506 males and females selected from psychiatric, drug treatment, and at-risk populations (biological child of persons diagnosed with antisocial PD), found some degree of fit between three PCL-R factors, a DSM-III-R diagnosis of antisocial PD, and a ICD-10 diagnosis of dyssocial PD (World Health Organization, 1992), although the

antisocial and dyssocial personality constructs failed to identify items that could be construed to represent the Deceitful Interpersonal Style factor of their proposed model (Cooke & Michie, 2001).

Most recently, Hare has begun to explore a four-factor structure of psychopathy made up of Cooke's three factors combined with a fourth factor, one that he terms Persistent and Varied Rule Breaking (Hare, personal communication). This research, which is being replicated on a large combined sample in Canada, has not yet been published but is included in the current analysis in a preliminary fashion.

### *1.2. Comorbidity of psychopathy*

Another approach to understanding the structure and meaning of psychopathy has involved the exploration of its comorbidity with the 10 PDs recognized by DSM-IV (APA, 2000). Blackburn (1998) and Coid used the PCL-R and SCID-II interviews with a sample of 18 psychopaths and 68 nonpsychopaths and found that psychopaths suffered from a variety of Axis I disorders, including alcohol abuse, dysthymia, depression, and schizophrenia. The only significant differences, however, involved a higher prevalence of drug abuse and a more frequent history of somatization disorder among the psychopaths. When comparisons were made with PD diagnoses, PCL-R scores were found to correlate positively with paranoid PD, antisocial PD, borderline PD, narcissistic PD, and passive aggressive PD, and negatively with dependent PD. Blackburn concluded that these results replicated those reported in an earlier study by Hart and Hare (1994) and support the notion of psychopathy as constituting a broad dimension of PD.

Based on Schneider's (1923) theory of psychopathy, Nedopil, Hollweg, Hartmann, and Jaser (1998) examined the relationship between psychopathy and major forms of mental illness including schizophrenia, dementia, substance dependence, and the various Axis II PDs. They derived a psychopathy estimate from a 512-item Forensic Psychiatric Documentation System (FPDS) and found little overlap with the major forms of mental illness. However, of 114 individuals thought to be psychopathic, 27% met criteria for substance dependence, 37% for minimal brain dysfunction, and 41% for PDs primarily of the dissocial, histrionic, and narcissistic types. The authors acknowledge the preliminary nature of these findings, and emphasize the need for further research to clarify the controversy between psychopathy as a distinct clinical entity or a comorbid combination of malignant character traits.

Widiger and Lynam (1998) have sought to interpret the psychopathy construct within the five-factor model (FFM) of normal personality functioning. Using the five dimensions of personality recognized in the FFM model (i.e., neuroticism, extraversion, openness, agreeableness, and conscientiousness), they have applied each of the 20 PCL-R items to this framework. Based upon this exploration, they conclude that the psychopath is a person characterized by high antagonism, low conscientiousness, and low anxiety. Clinically they suggest that persons with this constellation of characteristics will "invariably" be of immediate and substantial concern to other members of society. Theoretically, they suggest that psychopathy is a unique collection of personality traits and not a homogeneous, clinical entity.

### 1.3. Gender and psychopathy

Only recently has the psychopathy construct been explicitly applied to women and explored in terms of its structure, relevant cut-off scores, and associated traits and behaviors. The research that has been conducted has focused on university students (Forth, Brown, Hart, & Hare, 1996; Forth, Kisslinger, Brown, & Harris, 1993; Lilienfeld & Andrews, 1996), substance abusers (Cooney, Kadden, & Litt, 1990; Rutherford, Cacciola, Alterman, & McKay, 1996), and incarcerated female inmates (Salekin, Rogers, & Sewell, 1997; Vitale & Newman, 2001). The studies examining psychopathy among incarcerated samples (Loucks 1995; Neary, 1990; Salekin et al., 1997; Strachan, 1995; Tien, Lamb, Bond, Gillstrom, & Paris, 1993) suggest rates varying from 9% to 31%, a finding that has been both likened to and contrasted with the rate of psychopathy found in male samples.

Salekin et al. (1997) examined the construct of psychopathy among a sample of 103 detained female offenders in a local jail. Using three measures of antisocial personality, the PCL-R, Personality Assessment Inventory (PAI), and the Personality Disorder Examination (PDE), they found different rates of morbidity based upon the instrument used. When using the PCL-R only, 16% of the women were above the cut-off score for psychopathy, although 33% were elevated on the criteria for antisocial personality contained within the other two measures.

As part of this study, Salekin et al. (1997) conducted an EFA of their data to explore the relative fit of a two-factor model (Cooke, 1995; Harpur, Hare, & Hakstian, 1989; Hobson & Shine, 1998; Kosson, Smith, & Newman, 1990). They found that a two-factor solution best fit their data, and that two variables uniquely cross-loaded on both factors (i.e., poor behavioral controls and impulsivity). While the item “many short-term marital relationships” did not load for either sample, the remaining two items differed among the male and female samples (i.e., “failure to accept responsibility” and “revocation of conditional release” for females as contrasted to “criminal versatility” and “promiscuous sexual behavior” for males). Integrating these findings into an alternative two-factor model, Salekin et al. describe their new Factor 1 as being characterized by a lack of empathy or guilt, interpersonal deception, proneness to boredom, and sensation seeking, whereas Factor 2 was found to contain early behavioral problems, poor behavioral controls, and adult antisocial behavior. Salekin et al. report a positive correlation between psychopathy and histrionic PD, as well as between measures of dominance, mania, and aggression on the PAI. A consistent negative correlation was found between the warmth scale of the PAI and total, Factor 1, and Factor 2 scores on the psychopathy measure, suggesting that the women scoring high on the PCL-R were lacking in warmth, empathy, and interpersonal sensitivity.

A single gender comparison study has examined the response patterns of 36 females and 36 males referred for forensic psychiatric evaluation in Sweden between 1988 and 1990 (Grann, 2000). Using pairs matched by age, ethnicity, socioeconomic background, index crime, and number of previous violent crimes, Grann (2000) performed a stepwise discriminant analysis with gender as the grouping variable and the 20 PCL-R variables as independent variables. They found psychopathy to be more common among males (31%) than females (11%), although the differences in total, Factor 1, and Factor 2 means scores

were not significant. The discriminant analyses were able to differentiate between the males and females with a correct classification rate of 74% using three items—callous/lack of empathy and juvenile delinquency which were “male items,” and promiscuous sexual behavior which was a “female item.” Grann critically observed that these results could reflect actual gender differences in psychopathy among men and women, or alternatively gender biases in the types of questions asked and the information reported in psychiatric and criminal files.

A recent study by Vitale, Smith, Brinkley, and Newman (2002) contains the first large-scale examination of this concept among 528 nonpsychotic female offenders. They found a relatively low base rate of 9% among this sample, and attributed this either to a lower base rate of psychopathy among women or the inclusion of items in the PCL-R that do not adequately capture this personality construct among women. Their use of various self-report measures of psychopathology to validate the construct further demonstrated no significant relationship between scores over 30 on the PCL-R and scores on EPQ-Neuroticism scale, BAI, BDI, MPQ-PA (positive affectivity), SCL-90-GSI and estimated WAIS IQ. Significant differences were found between scores on the anxiety measure (WAS) and negative affectivity (MPQ-NA) in Caucasian women, and anxiety and estimated IQ scores among African American women. Vitale et al. suggest that these associations may have etiological significance and result in the misclassification of “neurotic” or “secondary” psychopathy in some women, a category addressed but differentiated from “primary” psychopaths in the early writing of Cleckley (1941). They further conclude that the relative lack of comorbidity across instruments offers discriminant validation of the description of the psychopath as an individual who is free of “nervousness or psychoneurosis.”

To explore further the structural and diagnostic underpinnings of psychopathy specifically as it applies to women, we examined psychopathy as measured by the PCL-R among a sample of 138 women incarcerated at a maximum-security prison. Using CFA, the Hare two-factor and Cooke three-factor solutions were applied to the data to explore their relative usefulness in explaining the underlying structure of the concept in women. An analysis of the relationship of PCL-R total score and factor scores as they relate to the 10 PDs recognized by DSM-IV was also undertaken to determine the degree of comorbidity observed between psychopathy and other formulations of personality maladjustment.

## 2. Method

### 2.1. *Participants and procedures*

The sample comprised 138 female felons incarcerated at a maximum-security prison for women. The demographic characteristics of the women including age and race, the length of sentence were obtained from the prison information database. Each of the 138 women had been part of an earlier study which examined DSM-IV personality diagnoses among a larger sample of 261 female inmates. The 261 inmates had been selected based upon a screening of 802 inmates, which included the Brief Symptom Inventory (BSI), the Barratt Impulsivity

Scale (BIS), the Prison Adjustment Questionnaire (PAQ), and the Structured Clinical Interview for DSM-IV Personality Screening Questionnaires (SCID-II Screen). The goal of the screening was to identify 250 women who were not psychotic and who were likely to meet diagnostic criteria for Cluster B psychopathology. As summarized in an earlier publication, the research sample was slightly younger and had more counts of institutional misconduct but did not differ on the variables of race, violent criminal offending, sentence, or security classification from the entire prison population (Warren, Burnette, South, Chauhan, Bale, & Friend, 2002; Warren, Hurt, Loper, Bale, Friend, & Chauhan, 2002). In conducting the PCL-R interviews, efforts were made to contact all inmates who had completed the SCID-II interviews approximately 12 months earlier. Due to natural attrition involving release and transfer to lower security prisons, the total PCL-R sample was composed of 138 women.

## 2.2. Measures

### 2.2.1. Psychopathy Checklist-Revised

As part of a battery of diagnostic interviews, the inmates were invited to participate in interviews designed for coding the PCL-R and the HCR: 20 (Webster, Douglas, Eaves, & Hart, 1997). The PCL-R (Hare, 1991; Harpur et al., 1989) is a 20-item instrument that is scored 0, 1, or 2 based upon a clinical interview and review of file information. Scores were computed by summing items to create a total score, scores for Hare's two-factor model, and scores for Cooke's three-factor model. Hare Factor 1 was the sum of items 1, 2, 4, 5, 6, 7, 8, and 16 on the PCL-R, whereas Hare Factor 2 was the sum of items 3, 9, 10, 12, 13, 14, 15, 18, and 19 (items 11 and 17 do not score on either factor). Cooke Factor 1 included items 1, 2, 4, and 5, Cooke Factor 2 was the sum of items 7, 8, 9, and 16, and Cooke Factor 3 was the sum of items 3, 14, 15, 9, and 13.

Each inmate file was reviewed by six coders who summarized the following information using a file review template form: family history, psychiatric history, employment history, and criminal record. Prior to interview, PCL-R items were coded based upon the information contained within the prison file. The interviewers were allowed to raise these scores after the clinical interview but not to lower them based upon their clinical impressions. This decision was made to avoid the cases where a positive clinical impression during a one-on-one interview would override documented evidence of a psychopathic behavior or trait.

A 6-week training course was implemented for the interviewers conducting the PCL-R interviews. Each coder was introduced to the instrument and item scoring criteria over the course of several meetings with six practice tapes being used to apply the concept to the clinical materials. After the completion of this group effort, each of the six interviewers independently completed eight taped reliability interviews. Once adequate reliability was demonstrated on these, the interviewers were allowed to start interviewing at the prison where they double coded their first five interviews. Reliability estimates included these five double-coded interviews as well as all other interviews coded by more than one interviewer due to participant availability. Intraclass correlation coefficients (ICCs) for the interviews were highly robust, with a reliability of .88 for Factor 1, .99 for Factor 2, and .95 for the PCL-R total score.

### 2.2.2. Structured Clinical Interview for DSM-IV Personality Disorders

The Structured Clinical Interview for DSM-IV Personality Disorders (SCID-II), a semistructured interview, was used for diagnosing the 10 DSM-IV PDs (First, Spitzer, Gibbon, Williams, & Benjamin, 1995a, 1995b). Training on the SCID-II involved a series of training sessions, mock interviews using the SCID-II Clinical Interview, and double coding of 10 inmate interviews by each interviewer. The presence of personality pathology was calculated using continuous scoring. Reliability of this measure ranged from moderate to excellent (Warren et al., in press). The final sample based upon the earlier screening resulted in a sample of 86 inmates who did not meet diagnostic criteria for any PD; 132 inmates who met diagnostic criteria for Cluster B psychopathology either singularly or in combination with other diagnoses; and 42 inmates who met diagnostic criteria for either Cluster A or C psychopathology, singularly or in combination with other non-Cluster B diagnoses.

## 3. Results

Table 1 summarizes scores on the various PCL-R items for the entire sample, those women who scored over the traditional cut-off of 30, and those that scored over the European cut-off of 25. Of the 138 female inmates, 17.4% of the sample had scores above Hare's cut-off of 30 for psychopathy, whereas 46.4% had scores above the European cut-off of 25. To facilitate comparison with other samples compiled within the United States, the more conservative cut-off was used for further group comparisons.

Items endorsed (i.e., a score of 2) by more than half of the women in the sample included a need for stimulation/proneness to boredom, pathological lying, being conning/manipulative, demonstrating poor behavioral controls, impulsivity, irresponsibility, and revocation of conditional release. As shown in Table 1, women meeting either the Hare or European cut-off scores displayed significantly ( $P < .05$ ) higher endorsement rates of all PCL-R criteria as compared to women below these cut-offs.

Table 2 summarizes descriptive statistics for PCL-R factor and total scores, as well as demographic information for the sample. The mean PCL-R score for the overall sample was 22.5 out of a possible 40 (range 3.2 to 36). When the sample was grouped according to Hare's cut-off, no significant differences were found with regard to age, length of sentence, or race between women above or below the cut-off.

### 3.1. Confirmatory factor analysis overview

The fit of each model was examined using the confirmatory maximum likelihood factor analysis with LISREL 8.30 (Joreskog & Sorbom, 1996). The minimum fit function of chi-square ( $\chi^2$ ) assesses the model against the null hypothesis that the model fits the population perfectly. The better a model fits the data, the smaller the  $\chi^2$  and the further the  $P$  value from zero. Because the chi-square is sensitive to sample size and number of variables, additional measures of fit were used. The comparative fit index (CFI; Bentler,



Table 1

Frequencies of PCL-R item endorsement for total sample and according to Hare and European cut-offs

PCL-R item	Percent of total sample <sup>a,b</sup> ( <i>n</i> = 138)			Percent of PCL-R > 30 <sup>a</sup> ( <i>n</i> = 24)			Percent of PCL-R > 25 <sup>b</sup> ( <i>n</i> = 64)		
	0: No	1: Maybe	2: Yes	0: No	1: Maybe	2: Yes	0: No	1: Maybe	2: Yes
1. Glibness/ superficial charm	35.5	29.7	34.8	12.5	25.0	62.5	28.1	25.0	46.9
2. Grandiose sense of self worth	35.5	32.6	31.9	16.7	25.0	58.3	18.8	34.3	46.9
3. Need for stimulation/ proneness to boredom	18.1	27.6	54.3	0.0	8.3	91.7	1.6	20.3	78.1
4. Pathological lying	10.9	35.5	53.6	0.0	20.8	79.2	4.7	28.1	67.2
5. Conning/manipulative	10.9	31.9	57.2	4.2	12.5	83.3	3.1	18.8	78.1
6. Lack of remorse or guilt	21.0	34.1	44.9	0.0	8.3	91.7	1.6	32.8	65.6
7. Shallow affect	44.2	34.1	21.7	8.4	33.3	58.3	20.3	40.6	39.1
8. Callous/lack of empathy	23.2	37.7	39.1	0.0	12.5	87.5	3.1	39.1	57.8
9. Parasitic lifestyle	19.6	50.0	30.4	0.0	58.3	41.7	3.1	50.0	46.9
10. Poor behavioral controls	18.1	23.9	58.0	0.0	8.3	91.7	6.3	20.3	73.4
11. Promiscuous sexual behavior	29.7	22.5	47.8	4.1	29.2	66.7	15.6	20.3	64.1
12. Early behavior problems	51.4	22.5	26.1	8.3	20.9	70.8	26.6	23.4	50.0
13. Lack of realistic, long-term goals	26.8	38.4	34.8	0.0	33.3	66.7	9.4	39.0	51.6
14. Impulsivity	12.3	26.8	60.9	0.0	4.2	95.8	0.0	15.6	84.4
15. Irresponsibility	5.1	26.8	68.1	0.0	12.5	87.5	0.0	17.2	82.8
16. Failure to accept responsibility	18.8	43.5	37.7	8.3	29.2	62.5	10.9	45.3	43.8
17. Many short-term marital relationships	68.1	16.7	15.2	50.0	20.8	29.2	51.6	25.0	23.4
18. Juvenile delinquency	62.3	21.8	15.9	33.3	33.3	33.4	39.1	37.5	23.4
19. Revocation of conditional release <sup>1,2,3</sup>	17.4	2.9	52.9	8.3	8.3	66.7	10.9	6.3	65.6
20. Criminal versatility	37.7	30.4	31.9	16.7	29.2	54.2	23.4	25.0	51.6

Superscripts denote significant group differences,  $P < .05$ ,  $df = 136$ .<sup>1</sup> 26.8% of the total sample were first-time offenders resulting in omission of this item.<sup>2</sup> 16.7% of PCL-R  $\geq 30$  were first-time offenders resulting in omission of this item.<sup>3</sup> 17.2% of PCL-R  $\geq 25$  were first-time offenders resulting in omission of this item.

1990) is a measure of comparison between the null model and a saturated model, or one that includes all possible paths between variables. Models with CFI values greater than .90 are thought to be acceptable fits of the data. Joreskog and Sorbom (1986) have also used the goodness-of-fit index (GFI) and the adjusted goodness-of-fit index (AGFI) as measures of fit. GFI values greater than or equal to .85 and an AGFI greater to or equal to .80 reflect a good model fit (Anderson & Gerbing, 1984). Finally, the root mean square error of approximation (RMSEA) assesses the degree of fit between the results and a perfectly fitted model computed per degrees of freedom, thereby minimizing the effects of sample

Table 2  
Demographic characteristics and mean PCL-R scores of total sample and according to Hare's cut-off

	Full sample ( <i>n</i> = 138)	PCL-R > 30 <sup>a</sup> ( <i>n</i> = 24)	PCL-R < 30 <sup>a</sup> ( <i>n</i> = 114)
<i>PCL-R variables mean (S.D.)</i>			
Hare two-factor model			
Hare Factor 1	9.2 (3.8)	13.3 (2.2)	8.3 (3.5)
Hare Factor 2	10.7 (3.9)	15.1 (1.8)	9.8 (3.6)
PCL-R total score	22.5 (7.2)	32.2 (2.2)	20.5 (6.1)
Cook three-factor model			
Cooke Factor 1	4.9 (2.1)	6.5 (1.7)	4.5 (2.0)
Cooke Factor 2	4.4 (2.3)	6.8 (1.2)	3.8 (2.2)
Cooke Factor 3	6.7 (2.4)	8.8 (1.0)	6.2 (2.4)
Additional items: Factor 4	4.7 (2.7)	7.3 (1.8)	4.2 (2.6)
<i>Demographic variables<sup>b</sup></i>			
Age (%)			
< 31	55.10	62.50	53.50
≥ 31	44.90	37.50	46.50
Race (%)			
White	34.30	33.30	34.50
Non-White	65.70	66.70	65.50
Sentence (%)			
< 5 years	22.80	16.70	24.10
> 5 years	77.20	83.30	75.90

<sup>a</sup> All PCL-R variables significant at  $P < .0001$ ,  $df = 136$ .

<sup>b</sup> All demographic variables were not significant.

size as contained in the  $\chi^2$  statistic. It is generally accepted that a RMSEA of .05 reflects good fit.

### 3.2. Factor analysis model specifications

These multiple fit indices were tested on models run in two different ways: first with only raw items, and second with testlets, defined as summed scores on two or more raw items. This testlet technique is often helpful in creating more variance in the input variables, thus yielding more robust results. In confirming Cooke's three-factor model, the original 6 testlets derived by Cooke and Michie (2001) were used. However, for Hare's confirmatory analysis and subsequent analyses, which added the two omitted PCL-R items, new testlets were statistically and rationally derived based on the pattern of correlations between items. Items included within testlets are shown in path diagrams for Cooke's 6-testlet model, Hare's 8-testlet model, Cooke's 10-testlet model, and Hare's two-factor model with raw items (see Figs. 1–4). Lastly, a four-factor model, which is described by Hare (R. D. Hare, personal communication, February 4, 2002) was tested. This last model includes the three factors described by Cooke, as well as an additional fourth factor composed of additional items (see Fig. 5). A testlet approach was not used with this last analysis due to

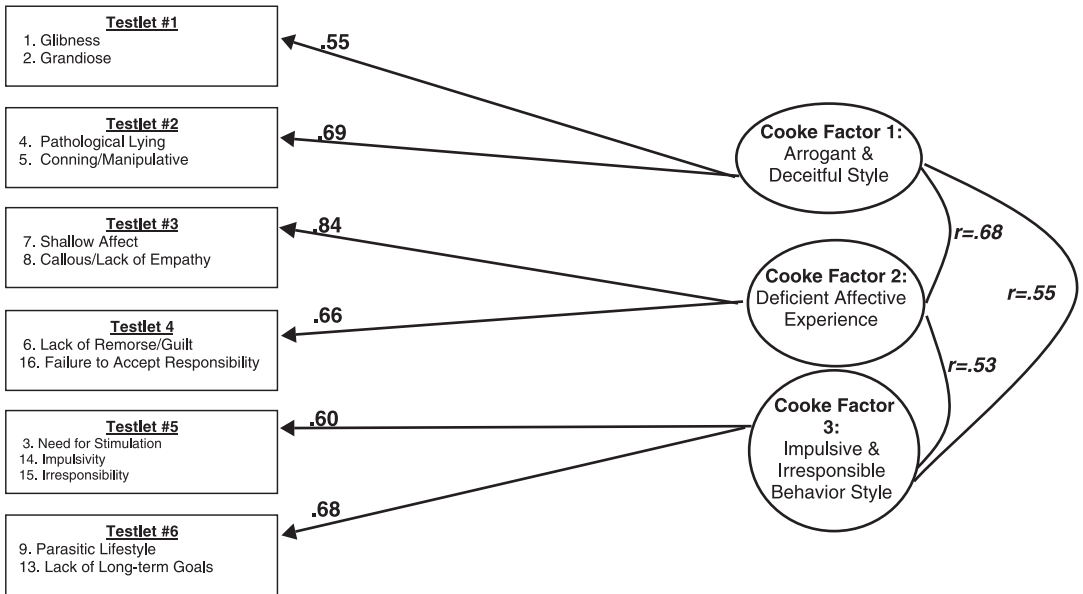


Fig. 1. Path diagram for Cooke's three-factor model (with six testlets).

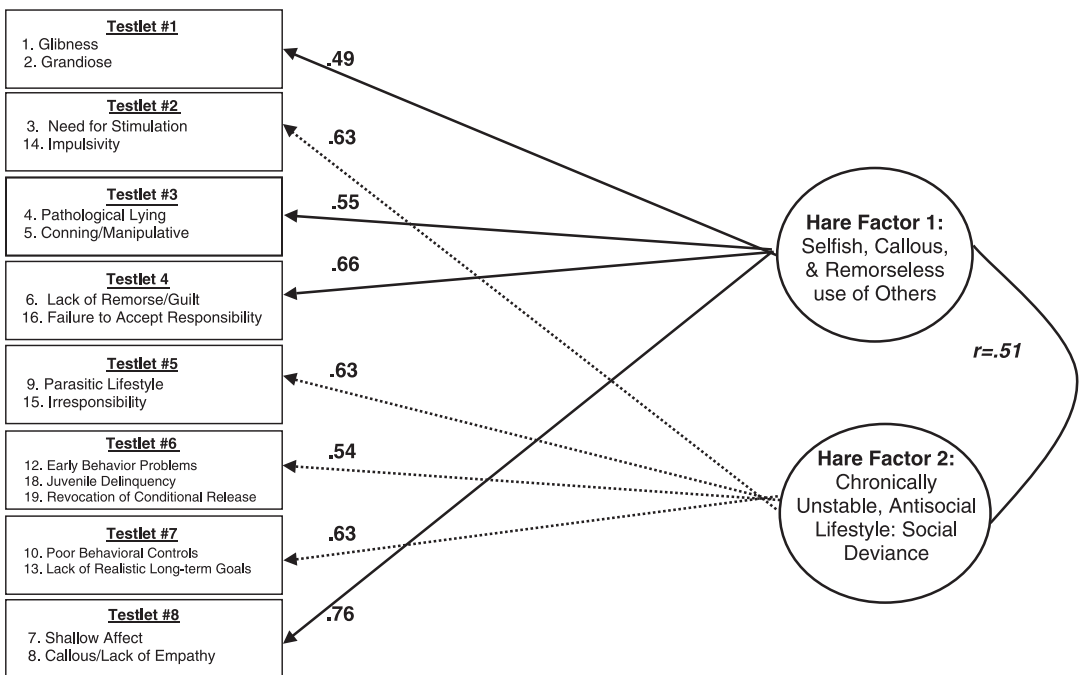


Fig. 2. Path diagram for Hare's two-factor model (with eight testlets).

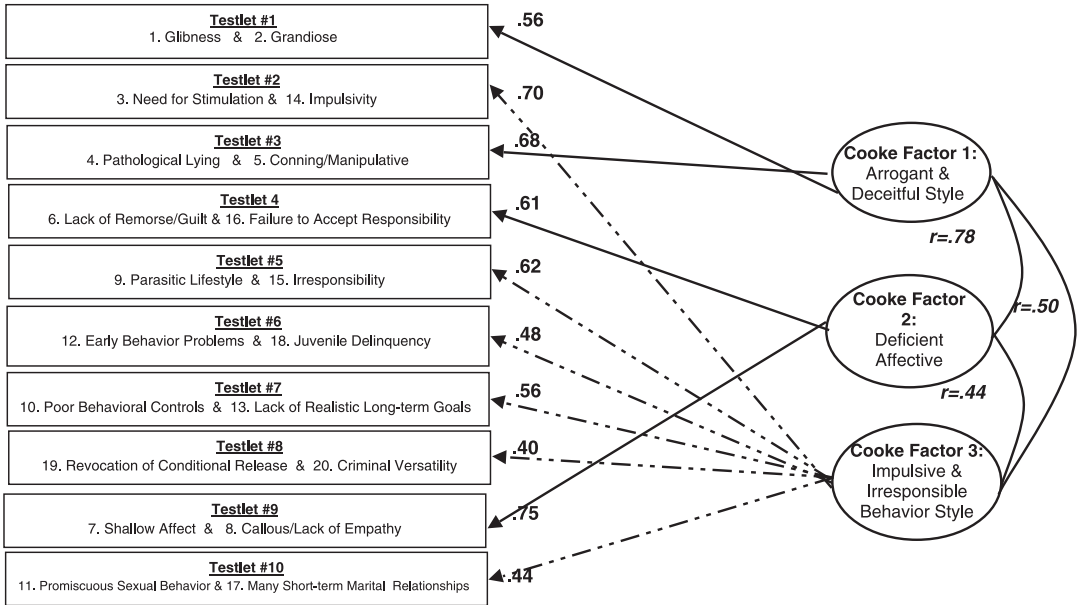


Fig. 3. Path diagram of Cooke's three-factor model (with 10 testlets).

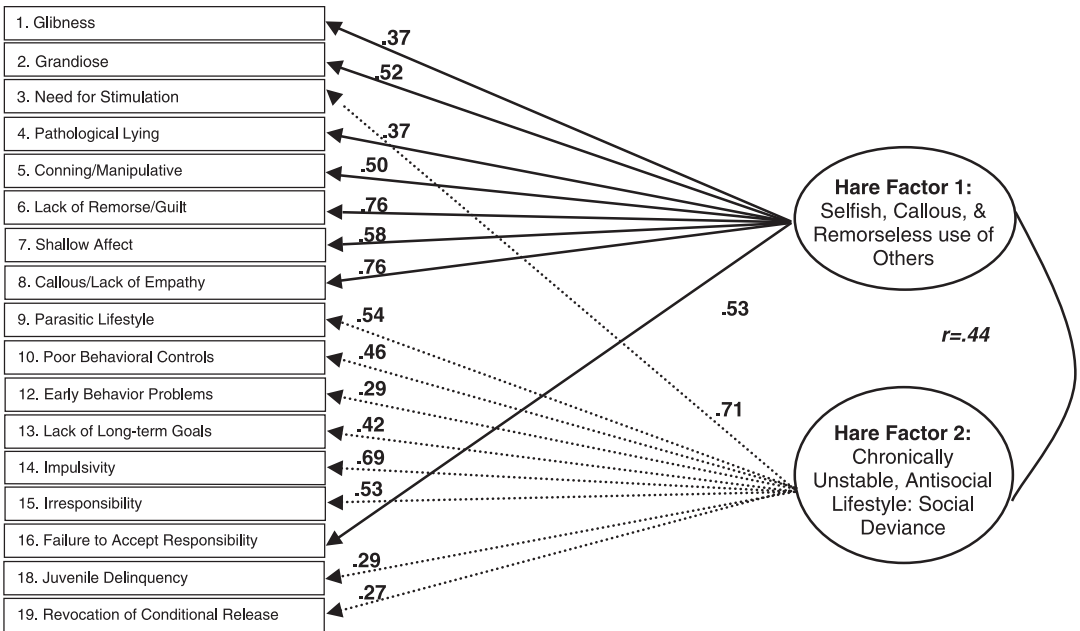


Fig. 4. Path diagram of Hare's two-factor model (with raw items).

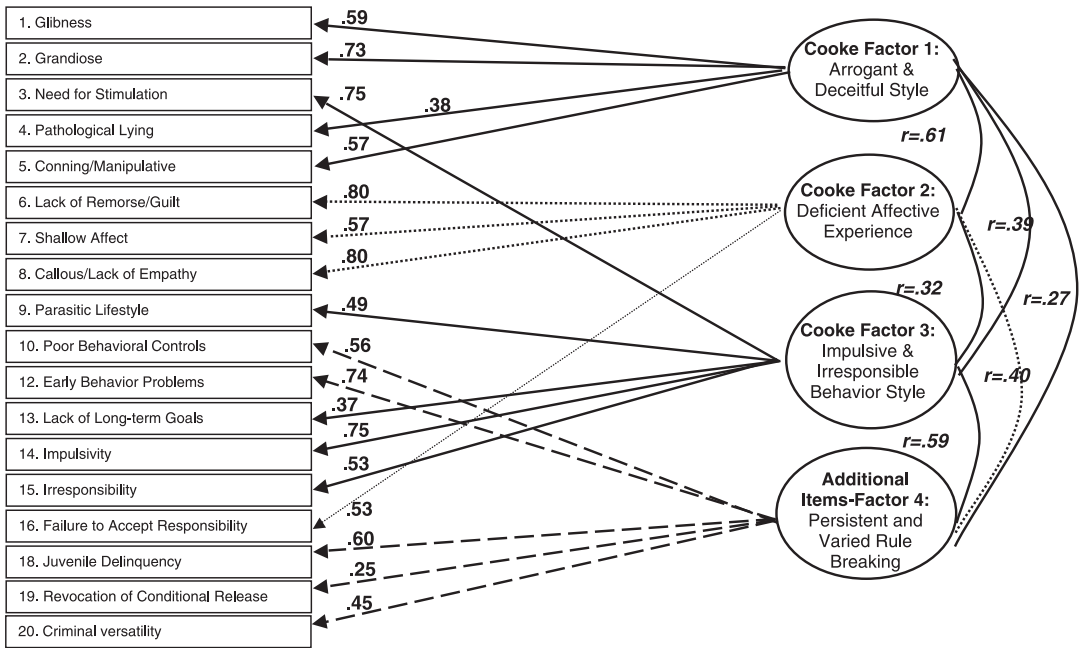


Fig. 5. Path diagram for four-factor model (with raw items).

the large number of factors. Table 3 demonstrates the correlations between individual PCL-R items.

Both Cooke’s and Hare’s models omit several PCL-R items from their final factors. Although the rationale for these omissions has been tested in a male population, the present study sought to examine whether the factor structure in a female population would be better represented by the inclusion of all PCL-R items. To accomplish this goal, two additional models were run using 10 testlets (representing all 20 items) for both the two- and three-factor models.

### 3.3. Factor analysis results

Fit indices for each model are summarized in Table 4. As shown, whereas the original Hare two-factor model failed to meet any of the criteria for an adequate goodness of fit, the remaining models provided a moderately good fit to the data, with the four testlet models representing improvement over the two models using only PCL-R raw items. Overall, Cooke’s six-testlet model demonstrated the best fit for the data out of all models presented ( $\chi^2 = 15.95$ ,  $df = 16$ ,  $CFI = .93$ ,  $GFI = .96$ ; see Fig. 1). The Hare 8-testlet model (see Fig. 2), although giving a better fit to the data than the Hare 10-testlet model, still did not fit the data as well as the Cooke 6-testlet model. Furthermore, the two 10-testlet models, which included all PCL-R items, displayed moderately good fit, but did not represent an improvement in fit over either the Hare 8-testlet model or the Cooke 6-testlet model. Finally, the four-factor

Table 3  
Correlations between PCL-R items

PCL-R item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
1. Glib																				
2. Grandiose	.52**																			
3. Need for stimulation	.14	.22*																		
4. Lying	.18*	.22**	.16																	
5. Conning	.28**	.37**	.27**	.29**																
6. Lack of remorse	.23**	.31**	.15	.23**	.31**															
7. Shallow affect	.06	.28**	.28**	.18*	.30**	.42**														
8. Callous	.21*	.33**	.16	.22*	.34**	.63**	.50**													
9. Parasitic lifestyle	.01	.06	.30**	.12	.14	.19*	.23**	.17*												
10. Poor behavioral controls	.05	.15	.20*	.08	.20*	.22*	.21*	.33**	.26**											
11. Promiscuous sexual behavior	.08	.08	.28**	.18*	.09	.04	.16	.06	.18*	.27**										
12. Early behavior problems	.11	.11	.37**	.21*	.29**	.26*	.31**	.32**	.15	.43**	.18*									
13. Lack of long-term goals	.06	.20*	.24**	.11	.34**	.24**	.34**	.28**	.37**	.29**	.08	.20*								
14. Impulsivity	.08	.16	.61**	.13	.21*	.19*	.26**	.16	.32**	.32**	.40**	.33**	.15							
15. Irresponsibility	-.01	.19*	.35**	.13	.18*	.12	.17*	.10	.40**	.20*	.22**	.11	.26**	.41**						
16. Fail to accept responsibility	.30**	.35**	-.08	.16	.19*	.51**	.19*	.40**	-.01	-.11	-.02	-.01	.04	-.08	-.02					
17. Many marital relationships	.11	-.01	.25**	-.04	-.03	-.03	-.04	.01	.13	-.04	.24**	.11	-.02	.23**	.19*	-.07				
18. Juvenile delinquency	-.01	.06	.20*	.10	.07	.21*	.13	.18*	.10	.29**	.13	.51**	.18*	.21*	.02	-.11	.05			
19. Revocation of release	-.10	.03	.23**	.18*	.01	.12	.00	.05	.28**	.20*	.16	.24**	.14	.23**	.28**	-.15	.27**	.32**		
20. Criminal versatility	-.11	.04	.19*	.11	.09	-.01	-.06	-.10	.28**	.06	.07	.09	.13	.15	.25**	-.19*	.26**	.08	.60**	

\* Significant at  $P < .05$  level.

\*\* Significant at  $P < .01$  level.

Table 4  
Fit indices for confirmatory factor analysis models

Model	<i>N</i>	$\chi^2$	<i>df</i>	CFI	GFI	AGFI	RMSEA
Cooke's three-factor with six testlets	138	15.95	16	.93	.96	.87	.11
Hare's two-factor with eight testlets	138	38.50	19	.89	.93	.88	.09
Two-factor with 10 testlets <sup>a</sup>	138	76.69	34	.82	.90	.84	.10
Three-factor with 10 testlets <sup>a</sup>	138	68.80	32	.84	.91	.84	.09
Cooke's three-factor with raw items	138	110.00	62	.90	.89	.84	.08
Hare's two-factor with raw items	138	266.64	118	.65	.81	.76	.10
Four-factor with raw items	138	264.13	129	.79	.82	.77	.10

<sup>a</sup> Ten testlet models include all 20 PCL-R items.

model with raw items did not represent improvement of fit over the Cooke 6-testlet or the Hare 8-testlet model.

### 3.4. Personality disorders

Correlations between Hare Factor 1 and Cooke Factor 1 ( $r=.84$ ,  $P<.001$ ) and Cooke Factor 2 ( $r=.87$ ,  $P<.001$ ) were highly significant, as well as correlations between Hare Factor 2 and Cooke Factor 3 ( $r=.88$ ,  $P<.001$ ). Correlations between PD total symptom scores on the SCID-II and the PCL-R factor and total scores are shown in Table 5. As expected, PCL-R total score ( $r=.59$ ,  $P<.0001$ ), Hare Factor 2 ( $r=.63$ ,  $P<.0001$ ), and Cooke Factor 3 ( $r=.54$ ,  $P<.0001$ ) were most highly correlated with antisocial personality disorder (ASP). Surprisingly, paranoid PD was moderately correlated with both Hare Factor 2 ( $r=.32$ ,  $P=.0001$ ) and Cooke Factor 3 ( $r=.27$ ,  $P<.01$ ). Hare Factor 2 and Cooke Factor 3 showed a similar pattern of correlations, with both being significantly related to all PD symptomatology except avoidant, schizoid, obsessive–compulsive, and dependent. The pattern of correlations was also highly similar for Hare 1 and Cooke 1 and 2; both were negatively related to Avoidant

Table 5  
Correlations between psychopathy and PD symptoms on the SCID-II

Psychopathy	SCID-II diagnosis									
	ASP	NAR	HIS	BOR	AVOID	SZOID	PARND	STYPL	OC	DEPEN
PCL-R total score	.59 **	.21 **	.20 *	.17	-.13	.14	.19 *	.17 *	.08	.04
Hare Factor 1	.27	.12	.06	-.04	-.23 **	.14	.00	.07	.17 *	.00
Hare Factor 2	.63 **	.23 **	.23 **	.23 **	-.02	.13	.32 **	.18 *	.00	.07
Cooke Factor 1	.31 **	.11	.11	.05	-.18 *	.09	-.02	.01	.13	-.09
Cooke Factor 2	.17 *	.10	.01	-.10	-.22 **	.14	.01	.10	.16	.09
Cooke Factor 3	.54 **	.20 *	.22 **	.23 **	.02	.05	.27 **	.15	.04	.08
Additional items—factor 4	.51 **	.13	.11	.12	-.05	.14	.21 **	.11	-.09	.01

ASP=antisocial PD; NAR=narcissistic PD; BOR=borderline PD; AVOID=avoidant PD; SZOID=schizoid PD; PARND=paranoid PD; STYPL=schizotypal PD; OC=obsessive–compulsive PD; DEPEN=dependent PD.

\*  $P<.05$ .

\*\*  $P<.01$ .

PD, while Hare Factor 1 and Cooke Factor 2 approached significance at the  $P < .05$  levels with obsessive–compulsive PD. Interestingly, the Factor 4 proposed by Hare correlated highly with ASP ( $r = .51$ ,  $P < .01$ ) and paranoid PD ( $r = .21$ ,  $P < .01$ ) only.

#### 4. Discussion

The current findings suggest a considerable degree of similarity in the prevalence and structure of the psychopathy construct among women as compared to men. Earlier research suggests that approximately 15–25% of men incarcerated in a maximum-security prison meet diagnostic criteria for psychopathy using a 30 score cut-off (Hare, 1991). In the current sample, 17.4% of the female sample met the same criteria. This percentage supports earlier research among incarcerated females (Loucks, 1995; Neary, 1990; Salekin et al., 1997; Strachan, 1995; Tien et al., 1993), which suggests a “broadly comparable” prevalence between men and women given the anticipated gender biases contained in the current item scales of the PCL-R. These findings, however, contradict the recent research by Vitale et al. (2002) that found a prevalence rate of 9%. The sampling techniques used in the current study to identify a sample of inmates who met diagnostic criteria for Cluster B personality diagnosis might have skewed the number of psychopaths identified in the current study and inflated both the rate being reported and, therefore, the conclusions regarding similarities between men and women, at least in terms of prevalence. However, the selection criteria and refusal rates in the Vitale et al. study are not described in detail, which makes it difficult to compare the two samples.

The underlying construct of psychopathy in women appears to be highly congruent with the two- and three-factor models proposed by Hare and Cooke. CFA revealed that Cooke’s six-testlet model represented the best model for this female inmate sample as indicated by several fit indices. This suggests that whereas both models may be acceptable representations of the factor structure of psychopathy in women, the three-factor model may better account for the relationships between the proposed personality traits of psychopathy. Questions exist regarding whether this model is appropriate, given that it utilizes such a small number of testlets to derive three factors. Whereas Hare’s original two-factor model using raw items demonstrated the poorest fit (see Fig. 4), the use of rationally derived testlets (created by adding two or more highly correlated items) improved the fit of a two-factor model to an acceptable level. From this, we cannot conclude that the three-factor model provides significant improvement over the two-factor model of psychopathy. Findings are still largely consistent with those observed among large male samples, suggesting that the underlying structure of the construct is similar for both men and women.

Analyses including all PCL-R items are less straightforward to interpret. The relationship of promiscuity, engaging in several marital relationships, and criminal versatility to the construct of psychopathy in women remains unclear. Exploratory models including these three items provided some support for the hypothesis that these behaviors are important indicators of psychopathy in women, a finding that is partially supportive of Grann (2000) and Salekin et al.’s (1997) findings. However, the fact that these models were ultimately less



robust than Cooke's six-testlet model, which did not include these items, limits a fuller appreciation of their significance at this time.

Of particular interest in the current study is the finding regarding comorbidity between psychopathy and other PDs. Taken most broadly, the analyses suggest that psychopathy is a combination of diagnostic criteria associated with antisocial, narcissistic, histrionic, paranoid, and schizotypal PD. Recent findings regarding the relevance of nondelusional suspiciousness to the risk for violent behavior may help to explain the robust relationship between psychopathy and the risk for violent behavior (Monahan et al., 2001). Earlier research by Warren, Burnette, et al. (2002) and Warren, Hurt, et al. (2002) also demonstrated a high correlation between narcissistic PD and violent behavior by this sample of inmates within the prison environment. These findings offer preliminary support for the premise that psychopathy, at least in women, begins with a basic antisocial personality orientation that is made more malignant by its combination with the grandiosity and lack of concern for others intrinsic to narcissistic states, as well as suspicious perceptions about the need to protect oneself from a dangerous and intrusive external environment. These findings offer empirical support for the supposition offered by both Nedopil et al. (1998) and Widiger and Lynam (1998) from theoretically divergent perspectives that psychopathy is not a distinct clinical entity but rather a comorbid constellation of malignant personality traits.

The negative comorbidity found in the current study may also prove of interest. Although the analyses demonstrated a high degree of comorbidity between the total PCL-R scores and antisocial PD, narcissistic PD, histrionic PD, paranoid PD, and schizotypal PD, the Hare Factor 1, Cooke Factor 1, and Cooke Factor 2 showed significant negative correlations with a diagnosis of avoidant PD. This preliminary finding may indicate that the overt manifestation of psychopathic behavior is not tempered or contained by any sense of withdrawal, inhibition or reservation in relationship to others. If replicated on a larger sample, this finding might enrich our understanding of the comorbidity of psychopathy to include not only a positive association with certain Cluster A and Cluster B personality traits, but also a negative association with characteristics of certain Cluster C PDs.

In conclusion, these findings offer preliminary validation for the applicability of the psychopathy construct to women and suggest that the Cooke three-factor model and, slightly less so, the revised Hare two-factor model, offer the best degree of fit for both male and female samples. The high degree of comorbidity observed within this sample further supports the argument that psychopathy is a constellation of personality traits and not a distinct clinical entity. Further study of the behavioral antecedents of this disorder and its relationship to violent behavior among women would seem warranted, as well as the extrapolation of these personality-based attitudes and perceptions into treatment programs designed particularly for this unique population.

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