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Validating Female Psychopathy Subtypes: Differences in Personality, Antisocial and Violent Behavior, Substance Abuse, Trauma, and Mental Health

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Abstract

Recent empirical investigations utilizing male prisoners have begun to validate clinical conceptualizations of primary and secondary psychopathy subtypes. We extended this literature by identifying similar psychopathic subtypes in female prisoners on the basis of personality structure using model-based cluster analysis. Secondary psychopaths (n = 39) were characterized by personality traits of negative emotionality and low behavioral constraint, an early onset of antisocial and criminal behavior, greater substance use and abuse, more violent behavior and institutional misconduct, and more mental health problems including symptoms of post-traumatic stress disorder and suicide attempts. Primary psychopaths (n = 31) exhibited few distinguishing personality features but were prolific criminals especially in regards to non-violent crime, and exhibited relatively few mental health problems despite substantial exposure to traumatic events. The results support alternative etiological pathways to antisocial and criminal behavior that are evident in personality structure as well as gender similarities and differences in the manifestation of psychopathic personalities.

Keywords

psychopathy subtypes; female psychopathy; female prisoners; antisocial behavior

Psychopathy is a malignant personality disorder characterized by a persistent pattern of antisocial and criminal behavior and a callous, remorseless, manipulative, and narcissistic personality style. Though psychopathy has generally been construed as a unitary construct, certain clinical conceptualizations have posited psychopathic subtypes (for reviews see Poythress & Skeem, 2006; Skeem et al., 2003). Recent empirical investigations utilizing male prisoner samples have yielded substantial evidence in support of psychopathic

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subtypes broadly consistent with these conceptualizations (Hicks et al., 2004; Skeem et al., 2007). In the present investigation, we extend this literature by identifying subtypes of female psychopaths based on differences in personality structure.

Most theories of psychopathic subtypes focus on differentiating primary and secondary psychopathy variants, a typology first advocated by Karpman (1941,1948) and elaborated on by subsequent investigators (Blackburn, 1975;Lykken, 1957,1995;Mealey, 1995;Porter, 1996). Both subtypes are similar in terms of exhibiting high levels of antisocial and criminal behavior, but differ in their etiological underpinnings as evidenced by differences in personality structure. Primary psychopaths are incapable of emotions such as empathy and guilt, and so appear callous, cold, and lacking anxiety. In contrast, secondary psychopaths have a relatively normal capacity for emotional experience. Due to environmental stressors and trauma, however, they experience an excess of negative emotions and so exhibit high levels of anxiety and emotional distress, hostility, aggression, and impulsive behavior.

Differences between Psychopathic Subtypes

Recently, two methodologically sophisticated investigations reported results consistent with the primary and secondary psychopathy distinction (Hicks et al., 2004; Skeem et al., 2007). Both studies used model-based cluster analysis to identify psychopathic subtypes in male prisoners with high scores on the Psychopathy Checklist Revised (PCL-R; Hare, 2003), a clinical inventory developed to assess psychopathy in prison and forensic settings. Both investigations identified two subgroups nested within broader psychopathic samples. In terms of clustering variables, Hicks et al. (2004) used the 11 personality trait scales of the Multidimensional Personality Questionnaire-Brief Form (MPQ-BF; Patrick et al., 2002) in an American sample of federal prisoners, while Skeem et al. (2007) employed the four facet scales of the PCL-R (interpersonal, affective, lifestyle, and antisocial) and a self-report measure of trait anxiety in a sample of violent Swedish offenders.

Across studies, cluster and criterion validation analyses showed that measures of the broad trait construct of Negative Emotionality (NEM; Hicks & Patrick, 2006; Watson & Clark, 1984) best discriminated psychopathic subtypes. Both studies identified a primary psychopathy variant with low scores on facets of NEM related to anxiety and stress reaction, indicative of an emotionally stable personality style. In contrast, the secondary psychopathy subtype exhibited especially high scores on facets of NEM related to aggression, hostility, and alienation as well as anxiety, social withdrawal, and lack of self-control—a profile more consistent with severe emotional disturbance and personality disorder. Hicks et al. (2004) also found that the secondary variant (labeled aggressive psychopaths) reported engaging in more fights in childhood and adulthood, an earlier age of first criminal charge, slightly more alcohol use-related problems, and higher scores on the Welsh Anxiety Scale, whereas the primary variant (labeled emotionally stable psychopaths) scored slightly higher on a brief measure of intellectual functioning and socialization. Further, Skeem et al. (2007) found that secondary psychopaths exhibited more borderline personality disorder traits, major mental illness, and poorer global functioning.

While the results of Hicks et al. (2004) and Skeem et al. (2007) augmented the empirical support for psychopathic subtypes, further validation is needed. Noting parallels between theories of primary and secondary psychopathy and the empirical literature on the PCL-R, Hicks et al. (2004) hypothesized that subtype differences would mirror the differential correlates of PCL-R Factor 1 (F1; interpersonal and affective traits) and Factor 2 (F2; impulsive, antisocial, and chronically unstable lifestyle). Specifically, the distinguishing features of primary psychopathy would resemble the correlates of F1, including low NEM (especially its anxiety-related aspects), more non-violent crime and instrumental aggression, high narcissism, and modest advantages in intellectual functioning and social background

variables (Hall et al., 2004; Harpur et al., 1989; Hicks et al., 2004; Hicks & Patrick, 2006; Kennealy et al., 2007; Skeem et al., 2007; Verona et al., 2001; Woodworth & Porter, 2002). In contrast, the characteristics of secondary psychopathy would be consistent with the correlates of F2 including high NEM and low behavioral constraint, violent behavior, and institutional misconduct; early onset of antisocial and criminal behavior; greater substance use and abuse; more mental health problems such as suicide attempts and poorer global functioning; and greater environmental stress such as lower socioeconomic status and exposure to traumatic events, with concomitantly higher levels of post-traumatic stress disorder (PTSD) and dissociation (Hall et al., 2004; Harpur et al., 1989; Hicks et al., 2004; Hicks & Patrick, 2006; Kennealy et al., 2007; Poythress et al., 2006; Skeem et al., 2007; Skeem & Mulvey, 2001; Smith et al., 1990; Sullivan et al., 2008; Verona et al., 2001, 2005). Notably, F1 and F2 exhibit suppressor effects for many outcomes, and so their differential correlates are most reliably observed when controlling for their common variance (Hicks & Patrick, 2006). The utility of a subtype approach is that it identifies individuals high on these independent, latent psychopathy trait dimensions (as opposed to correlated, measured factor scores), clarifying the differential correlates without the need for statistical adjustments. While psychopathic subtypes have yet to be compared on all the differential correlates of F1 and F2, results to date have generally been consistent with these predictions. To conclude, further research is needed to identify additional variables that discriminate psychopathic subtypes from each other and from non-psychopathic individuals as well as to examine whether criterion variables known to distinguish male psychopathy subtypes also differentiate subtypes of female psychopaths.

Gender Differences in Psychopathy and Related Constructs

When evaluating gender differences, two types of group effects need to be considered: mean-level differences and differences in structure (Hicks et al., 2007; Kramer et al., 2008; Krueger et al., 1994; Moffitt et al., 2001). Mean-level differences refer to group differences in the prevalence or average levels of a variable. For example, men exhibit higher mean levels of psychopathy, antisocial behavior, and criminality than women (Bolt et al., 2004; Krueger et al., 1994; Moffitt et al., 2001). Structural differences refer to group differences in the pattern of associations (i.e., correlations) between target constructs and criterion variables. For example, Kennealy et al. (2007) demonstrated in a large sample of female prisoners (from which participants for the current investigation were drawn) that associations between PCL-R factor and facet scores and various criterion variables were highly consistent with results reported previously for male prisoners. More generally, relatively few structural differences have been found between men and women, but small to moderate mean-level differences are relatively common (Krueger et al., 1994; Moffitt et al., 2001).

Both mean-level and structural differences may affect the generalizability of findings across groups. For example, Kennealy et al. (2007) used receiver operating characteristic (ROC) curves to evaluate differing PCL-R cutoff scores for a diagnosis of psychopathy in female prisoners using Cleckley global ratings as the criterion for group membership—the same procedure that lead to the convention of using a PCL-R score of 30 as a diagnosis of psychopathy for men (Hare, 1980). Kennealy et al. found that a PCL-R cutoff score of 27 produced sensitivity and specificity statistics more comparable to male prisoners. Item response theory analyses also show that women exhibit latent trait scores about 0.5 standard deviations lower than men on PCL-R defined psychopathy, with some evidence of differential item functioning (Bolt et al., 2004). Gender differences are also evident in the criminal justice system, specifically, women who are incarcerated exhibit greater levels of psychopathology, environmental deprivation, and victimization, and lower levels of global functioning in comparison to incarcerated men (Maden et al., 1994; McClellean et al., 1997;

Mulder et al., 1994; Teplin et al., 2002). Gender differences are also observed in personality trait variables. Specifically, women score higher on measures of stress reaction, social closeness, and behavioral constraint whereas men score higher on measures of aggression, social dominance, and agency (Blonigen et al., 2008; Roberts et al., 2001).

The Current Study

Our goal was to test whether primary and secondary psychopathy subtypes found in male prisoner samples would also be present in female prisoners. We employed the same subtyping approach used in Hicks et al. (2004). That is, we used model-based cluster analysis to identify subpopulations in female prisoners with high PCL-R scores based on profiles on the 11 personality trait scales of the MPQ-BF (Partick et al., 2002), a well-validated self-report inventory of normal personality.

An improvement over previous studies was the availability of a more extensive array of criterion measures including measures of personality, psychopathic traits, antisocial behavior and violence, criminal activity, institutional misconduct, substance use and abuse, social background and intellectual functioning, and mental health problems and treatment. This allowed us to test many of the hypotheses regarding subtypes differences; specifically, that primary-secondary psychopathy distinctions would mirror the differential correlates of F1 and F2. A particularly novel opportunity was the ability to examine subtype differences in exposure to traumatic events and PTSD—variables that have been hypothesized to be especially relevant to the etiology of secondary psychopathy (Porter, 1996) and criminal and antisocial behavior in women (Jordan et al., 1996; McClellan et al., 1997; Teplin et al., 1996; Warren et al., 2002).

Our primary hypothesis was that two subgroups of female psychopaths would be detected. We predicted that these subgroups would differ most markedly on personality traits related to NEM. However, due to mean-level gender differences in personality, we anticipated that female psychopathy subtypes would be less distinctive (i.e., extreme) in personality both in terms of less good adjustment for the primary subtype (higher stress reaction and lower agency) and less maladjustment for the secondary subtype (lower aggression and higher behavioral constraint). Because men and women exhibit similar structural associations in terms of correlates of PCL-R scores (Kennealy et al., 2007), we hypothesized that subtype differences (which should mirror F1 and F2 correlates) on criterion measures observed in men would also be present in women (e.g., secondary subtype would exhibit more violent behavior, substance abuse, and mental health problems).

Method

Participants

Participants were members of a larger sample of 226 female inmate volunteers recruited from the general population of the Federal Correctional Institution in Tallahassee, Florida, a medium security prison for women (Kennealy et al., 2007). Eligibility for participation included: not subject to imminent release date, no file evidence of a severe or persistent mental illness, and competence in English as demonstrated by conservational fluency and reading aloud a description of the study. The mean age of the sample was 31.9 years (*SD* = 6.8), and its racial/ethnic demography was 57.1% (*n* = 129) African-American, 29.6% (*n* = 67) non-Hispanic White, 10.6% (*n* = 24) Hispanic, and 2.6% (*n* = 6) other. All individuals provided informed written consent prior to participating in the study.

The sample was divided into a psychopathic group and a comparison group of female prisoners low on psychopathy (i.e., a control group). In male prisoner samples, a PCL-R total score of 30 (out of a possible 40) is typically used as a cutoff for inclusion in the

psychopathic group, with individuals scoring ≤ 20 constituting the non-psychopathic control group. Female prisoner samples, however, exhibit lower mean levels of PCL-R defined psychopathy. This required using a lower threshold on the PCL-R for the female prisoner groups, both to ensure adequate sample sizes for analyses and to control for the possibility that female prisoners diagnosed as psychopathic using a cutoff of 30 might represent a more pathological group than their male prisoner counterparts. Therefore, cutoffs were lowered to 25 for the psychopathic group (n = 70) and ≤ 17 for the non-psychopathic control group (n =70), yielding comparable and adequately sized samples to detect group differences. The psychopathic and non-psychopathic control groups did not differ in mean age or racial/ethnic composition. To ensure that lowering these thresholds would not alter our findings, we conducted supplemental analyses using cutoffs of 27 and 30 on the PCL-R for the psychopath group.

Clustering Variables

The personality traits assessed by the 11 primary trait scales of the MPQ-BF (Patrick et al., 2002) served as the grouping variables used in the model-based cluster analysis. The MPQ-BF is a 155-item self-report inventory designed to assess key constructs in personality psychology. Its 11 primary scales are organized around 4 higher-order factors: Agentic-Positive Emotionality (PEM), Communal-PEM, NEM, and Constraint (CON).

Agentic-PEM and Communal-PEM both include an association with the Well-being scale, reflecting optimism, enthusiasm, and cheerfulness. Agentic-PEM additionally includes Social Potency (dominance, attention seeking behavior, leadership) and Achievement (mastery motivation, perfectionism) scales, and measures an individual's tendency to experience positive emotions through working hard, goal attainment, and influencing others. Communal-PEM is distinguished by Social Closeness (tendency to form close and affectionate relationships with others) along with Well-being, and reflects the tendency to attain positive experiences and fulfillment through interpersonal relationships. NEM encompasses the primary scales of Stress Reaction (anxiety, mood instability, tendency to break down under stress), Alienation (feelings of victimization, blame externalization, suspiciousness), and Aggression (inclination toward violence, willingness to hurt others, interpersonal hostility, vindictiveness) and is a broad index of an individual's propensity to experience negative emotions. CON includes traits of Control (cautious, planful, and reflective behavior; aka Impulsivity, reversed), Harm Avoidance (avoidance of dangerous or thrilling activities; preference for routine over risk), and Traditionalism (conservative attitudes; conformity rather than rebelliousness) and serves as a measure of behavioral control. The final primary scale Absorption does not load preferentially on any higher-order factor and reflects differences in the proclivity for becoming lost in thought or entrancing stimuli and to experience altered states (e.g., hypnotic suggestion). Internal consistency reliabilities for the 11 primary scales are good to excellent (Cronbach's α ranged from .75 to .84; Patrick et al., 2002). The MPQ-BF also includes three validity scales: (1) the Unlikely Virtues, a 14-item scale indexing social desirability and impression management, (2) the True Response Inventory (TRIN) that provides a measure of stereotypic true or false responding, and (3) the Variable Response Inventory (VRIN) that provides a measure of random or haphazard responding. Of the total sample, 15 participants were excluded from the present analyses due to invalid profiles (see Patrick et al., 2002, for invalidity standards).

External Validation Variables

A thorough description of the assessment procedures and most of the measures used to validate the cluster groups has been provided in previous reports (Kennealy et al., 2007; Verona et al., 2005). Therefore, we provide relatively brief descriptions of the measures here.

PCL-R—The PCL-R is a clinician rating system that includes a semi-structured interview and review of file information (Hare, 2003). Clinicians use information from the interview and file to make ratings on 20 items relevant to the construct of psychopathy. Items are rated as 0 (*does not apply*), 1 (*applies somewhat*), or 2 (*definitely applies*). Interviewers were advanced undergraduate or graduate-level psychology students who participated in specialized training in use of the PCL-R. All interviews were videotaped and viewed by a second trained diagnostician who made independent ratings based on the interview and file information. Inter-rater reliability for the PCL-R total as indexed by the intraclass correlation was .91 for a single rater (ICC_1) and .94 for the mean of two raters (ICC_2). In addition to the PCL-R total score, we also examined the prisoner groups on the PCL-R F1 and F2 scores as well as the four facet scores: Interpersonal, Affective, Lifestyle, and Antisocial. For the four facet scores, the ICC_2 ranged from .85 to .92.

Antisocial Personality Disorder (APD)—Symptoms of *Diagnostic and Statistical Manual of Mental Disorders* (4^{th} ed.; *DSM-IV*; American Psychiatric Association, 1994) defined APD were also assessed based on information from the interview and file. The APD criteria include 7 adult symptoms and 15 childhood symptoms (i.e., the criteria for *DSM-IV* Conduct Disorder). The ICC_2 was .85 and .91 for the adult and childhood symptoms, respectively.

Criminality—Criminal activities were assessed through multiple indices including: age of onset, non-violent and violent criminal charges, and a criminal variety index. Age of onset variables included number of charges before age 17 and age of first charge. Non-violent crimes included charges for fraud, theft, drug-related crimes, and prostitution. Violent crimes included charges for robbery, assault, murder, and possession of a weapon. The total number of official charges was used as our measure of non-violent and violent crimes. Because many crimes go undetected by the authorities, for non-violent crimes, we also assessed number of self-reported crimes during the interview. For self-reported crimes, total scores were calculated by summing the number of different non-violent criminal categories. Finally, a criminal variety index was calculated by summing the number of different crime categories the participant had engaged in (four non-violent, four violent; either official charges or self-reported crimes).

Institutional misconduct—Measures of behavioral infractions in the prison were obtained using information from the prison file. Institutional misconduct was coded as violent or non-violent (*present* = 1, *absent* = 0). Violent infractions included fighting or assaulting prison inmates or staff, possessing a weapon, or destroying property. Non-violent infractions included possession of contraband (e.g., intoxicants), disobeying a direct order, violation of count (i.e., not being present for roll call), notices of incompatibility with cell-mates, non-conformance (e.g., failure to arrive on time to scheduled activities), gambling, theft, lying, sexual contact with other inmates, verbal confrontation, threats to prison staff or other inmates, and escaping from custody.

Interpersonal violence—Measures of interpersonal violence were obtained from the interview and prison file. These measures included self-reported number of fights as a child, number of fights as an adult, and violence against a romantic partner.

Substance use and abuse—Alcohol and drug use and abuse were assessed using several self-report questionnaires. The Survey of Alcohol and Drug Use (SADU) was used to assess quantity and frequency of use for nicotine, alcohol, and seven drug classes (Bachman, Johnston, & O'Malley, 1991). For each substance, participants indicated the number of uses for their lifetime, 12 months prior to incarceration, and 30 days prior to

incarceration. Composite scores were calculated by summing the three frequency items regarding use of each substance. Alcohol misuse and symptoms of abuse were also assessed using the Short Michigan Alcohol Screening Test (SMAST; Selzer, Vinokur, & van Rooijen, 1975) a 13-item questionnaire of alcohol use-related problems, and the Alcohol Dependence Scale (ADS; Skinner & Allen, 1982) a 29-item measure that emphasizes more extreme manifestations of alcohol abuse and dependence. Additionally, the Drinking Motives Questionnaire (DMQ; Cooper, Russell, Skinner, & Windle, 1992) was used to assess distinct behavioral and motivational patterns for alcohol use. The DMQ includes 15-items and three motive scales including: Social (drink to socialize and interact with others), Coping (drink to cope with emotional and other problems), and Enhancement (drinking to augment positive feelings). Finally, the Short Drug Abuse Screening Test (SDAST; Skinner, 1982), a 20-item questionnaire, was used to assess problems with drug use including symptoms of abuse and dependence.

Social background, education, and intelligence—Measures of social background were obtained from the interview and a review of file information. These measures included being raised by a single parent (*yes* = 1, *no* = 0), parental occupation, and whether either parent had a criminal record (*yes* = 1, *no* = 0). Information regarding the participant's educational attainment was also gathered from the interview and prison file. Educational and occupational levels were coded using the Hollingshead and Redlich (1958) formula, with lower scores indicating higher educational and occupational status. As part of the prison intake procedures, most inmates also completed the Shipley Institute of Living (SIL) scales, a brief screen of intellectual functioning (Zachary, 1996). The SIL yields verbal (vocabulary knowledge) and abstraction (abstract problem solving) scale scores and an estimated full scale IQ score.

Traumatic events and symptoms of PTSD—Information regarding participant's exposure to traumatic events was obtained from the interview, prison file, and responses on the Life Events Checklist (Gray et al., 2004). History of traumatic events was then coded (*yes* = 1, *no* = 0) across four categories: childhood physical abuse, childhood sexual abuse, adult physical assault, and adult sexual assault. A cumulative index of traumatic exposure was also calculated by summing the categories of traumatic events. Symptoms of PTSD were then assessed using the civilian version of the PTSD Checklist (Lang et al., 2003), a self-report questionnaire in which participants rated the extent to which each of the 17 symptoms of PTSD had bothered her over the past month on a 5-point scale from *not at all* to *extremely*. The mean rating across symptoms was used for group comparisons.

History of mental health treatment and suicide attempts—Measures of mental health treatment and history of suicide attempts were obtained from the interview and prison file. A composite measure of mental health treatment was calculated by summing the presence (*yes* = 1, *no* = 0) of the following indicators: treatment outside prison, treatment inside prison, history of psychiatric hospitalization, and history of taking medications for anxiety. A history of suicide attempts was coded as present or absent.

Data Analysis

Model-based cluster analysis was used to identify subtypes among the 70 psychopathic female prisoners based on differences on scores of the 11 primary scales of the MPQ-BF. Model-based cluster analysis partitions data into clusters based on their underlying probability distributions (Banfield and Raftery, 1993). Traditional cluster analyses such as hierarchical clustering and k-means clustering have a number of limitations in that they require the *a priori* specification of the number of clusters, lack a standardized fit statistic to assess the validity of a particular cluster solution including whether any clusters are actually

present in the data (i.e., these methods will always identify clusters), and may yield different cluster solutions for the same dataset (Aldenderfer and Blashfield, 1984). Model-based cluster analysis, a variant of mixture modeling (McLachlin & Peel, 2000), overcomes these limitations by fitting a series of cluster models to the data structure that allows for the calculation of a fit statistic, the Bayesian Information Criterion (BIC; Raftery, 1995). BIC values are then calculated for each cluster solution, allowing for comparisons of different solutions without the necessity of prior knowledge regarding the number of clusters in the data. Additionally, simulation studies have shown that this methodology can be used even for relatively smaller sample sizes ($n \leq 50$), as long as the means of resultant clusters are distinct and clusters are about equal in size (Lo, Mendell, & Rubin, 2001; Ning & Finch, 2004). A more detailed description of model-based cluster analysis is provided by Hicks et al. (2004).

We utilized the MCLUST package in the *R* statistical software package to implement model-based cluster analysis (Fraley & Raftery, 2006). Clusters were allowed to vary in their distributional structure (spherical, diagonal, or ellipsoidal) as well as in their volume, shape, and orientation in the variable vector space. Table 1 lists the 10 different cluster models; each model was tested when including 1 to 9 clusters. The MCLUST output function provides BIC values for all models, cluster classification of each participant for a given model, and the probability of each cluster assignments. Ideally, each participant will have a high probability of being a member of one cluster and a low probability of being a member of all other clusters. When evaluating model fit, greater (i.e., less negative) BIC values indicate better fit. When comparing alternative models, BIC differences of 0-2 provide weak evidence favoring the model with the greater BIC value, differences of 2-6 provide positive evidence, differences of 6-10 provide strong evidence, and differences greater than 10 are considered very strong evidence.

Following identification of the optimal cluster solution, the psychopathy subtypes and control prisoners were compared on several external validation measures. For quantitative measures, ANOVAs were performed comparing the psychopathy subtypes and control prisoners on each external validation variable. To control for multiple tests, significant omnibus effects were followed by groupwise post hoc comparisons using Tukey's procedure. Effect sizes (Cohen's *d*) are reported for all significant group differences (protected $p < .05$). For all categorical variables, odds ratios for group comparisons were converted to effect sizes following the procedures described by Chinn (2000). For descriptive purposes only, psychopathy subtypes and control prisoners were also compared on the MPQ-BF scales using a multivariate analysis of variance (MANOVA).

Results

Cluster Derivation

Table 1 summarizes results of the model-based cluster analysis applied to scores on the 11 primary trait scales of the MPQ-BF for the psychopathic female prisoner sample. The two best fitting models each identified two clusters. One model constrained the volume to be the same across clusters (BIC = -5615) whereas the other model allowed the volumes to vary (BIC = -5614), with the latter model specifying that one cluster constituted a more heterogeneous group than the other. As the two models were quite similar and resulted in identical cluster assignments for the participants, we simply chose the model with the greater BIC value; that is, the 2-cluster, variable-volume, spherical-shape model. This model assigned 31 participants to one ("primary psychopath") cluster, and 39 to the other ("secondary psychopath") cluster. For this best fitting model, we also examined the certainty of cluster assignment based on the posterior probability of cluster assignment for each participant. Given the model, 81.4% of the prisoners in the female psychopathy sample had

a probability ≥ .95 of being a member of their assigned cluster, and 92.8% had a probably ≥ .80. A similar 2-cluster solution was the best fitting model when using PCL-R cutoff scores of 27 (n = 49; primary n = 18, secondary n = 31) and 30 (n = 28; primary n = 11, secondary n = 17) with cluster assignment virtually the same for all individuals clustered.[1]

In terms of racial/ethnic composition, the first cluster (n = 31) was composed of 48.4% (n = 15) African American, 45.2% (n = 14) Caucasian, and 6.5% (n = 2) Hispanic individuals, with a mean age of 32.9 years (SD = 5.6 years, range 23 to 43 years). The second cluster (n = 39) was composed of 66.7% (n = 26) African American, 23.1% (n = 9) Caucasian, 7.7% (n = 3) Hispanic, and 2.6% (n = 1) individuals of other race/ethnicity, with a mean age of 29.9 years (SD = 7.1 years, range 20 to 45 years). The clusters did not differ significantly in terms of racial/ethnic composition, $\chi^2(3, N = 70) = 4.38$, $p > .10$, or mean age, $t(68) = 1.93$, $p = .058$.

Personality Differences

As scores the MPQ-BF scales were used to define the clusters, these scales cannot be used for the purpose of validation in the form of hypothesis testing. As preliminary descriptive analyses and comparison with previous studies of male prisoners, however, we report the scale means and standard deviations for the two female psychopathy clusters and the non-psychopathic control group in Table 2. To ease interpretation, the descriptive statistics are reported as T-scores scaled to the MPQ-BF normative sample, a large mixed-gender sample of 1350 community adults (mean age 40.3 years, range 19 to 70 years; see Patrick et al., 2002). For each prisoner group, we also report the standardized difference from the mean of the normative sample calculated as Cohen's d with an effect size of ±.37 being sufficient to detect a significant difference from the normative sample at $\alpha = .05$, two-tailed.

Relative to the normative sample, the non-psychopathic prisoners exhibited high scores on Alienation and moderately elevated scores on Achievement and Absorption and lower scores on Social Closeness. The first cluster had high scores on Alienation, and moderately lower scores on Social Closeness, Aggression, Absorption, and Stress Reaction. The differences in personality relative to the normative sample were not pronounced. However, this cluster exhibited some similarity to the emotionally stable or primary subtype identified in previous studies of male psychopathic offenders (Hicks et al., 2004; Skeem et al., 2007), and so, we refer to it as the primary subtype. The second cluster exhibited high scores on Alienation, Aggression, Stress Reaction, NEM, Absorption and Social Potency, and low scores on Social Closeness, Communal-PEM, Control, and CON. This cluster clearly paralleled the secondary or aggressive psychopathy subtype identified in male psychopathic prisoners (Hicks et al., 2004; Skeem et al., 2007), and so we refer to it as the secondary subtype.

We also conducted a three-group MANOVA to test for differences among the three prisoner groups on the 11 MPQ-BF primary scales. Again, as the MPQ-BF scales were used to derive the psychopathic subtypes, these MANOVAs were not conducted for the purpose of hypothesis testing per se, but rather to identify the variables underlying the group differences and estimate their relative effect sizes. This analysis yielded a large omnibus effect, $F(22, 246) = 9.21$, $p < .001$, Wilks' $\lambda = .301$. A second MANOVA comparing the

[1]We also conducted supplemental analyses wherein we combined the current female sample with the male psychopath sample (n = 96) in Hicks et al. (2004). When the psychopathic female prisoners were combined with the psychopathic male prisoners from Hicks et al. (2004), a 2-cluster solution was also the best fitting model regardless of the PCL-R total score used to establish the female psychopathic group (i.e., 25, 27, or 30). In each case, gender was unrelated to cluster status, $\chi^2(1) = .046$ to .814, $p = .37$ to .83. Cluster assignment was highly stable for both male and female prisoners: only 15 of the 166 prisoners ever changed cluster membership including going from the single to mixed gender sample or when using different PCL-R cutoffs. In terms of personality, the clusters for the mixed gender sample resembled the primary and secondary subtypes discussed below and in Hicks et al. (2004).

prisoner groups on the four higher-order factors also yielded a large omnibus effect, $F(8, 260) = 15.89$, $p < .001$, Wilks' $\lambda = .451$. Primary psychopaths scored lower than control prisoners on Traditionalism and Absorption only. Compared to control prisoners, the secondary psychopaths scored higher on Social Potency, Stress Reaction, Alienation, Aggression, Absorption, and NEM, and lower on Social Closeness, Control, Communal-PEM, and CON. Comparing the two psychopathy clusters to each other, the secondary subgroup scored higher on Stress Reaction, Alienation, Aggression, Absorption, and NEM, and lower on Control and CON. We also compared the three prisoner groups on the MPQ-BF validity scales using separate ANOVAs. The three groups did not differ on the TRIN or VRIN scales, but did show a difference on the Unlikely Virtues scale, $F(1, 139) = 3.38$, $p = .037$, with the secondary psychopaths scoring *lower* than the control prisoners ($p = .031$).

Validation of Subtypes: Differences on External Criterion Measures

PCL-R and APD symptoms—Group comparisons between the psychopathy subtypes and the non-psychopathic control prisoners are presented in Tables 3 through 7. By definition, both psychopathy subtypes scored higher than the control group on the PCL-R total score and each factor and facet score. The psychopathy subgroups also differed from one another in terms of PCL-R scores, with secondary psychopaths scoring higher on PCL-R F2, which was due to higher scores on the Antisocial facet. Both psychopathy subtypes also exhibited significantly more childhood and adult symptoms of APD than the control prisoners. Additionally, secondary psychopaths exhibited significantly more child symptoms of APD than primary psychopaths, which accounts for the subtype differences on F2 and the Antisocial facet

Criminality, institutional misconduct, and interpersonal aggression—In terms of age of onset of criminal behavior, secondary psychopaths had a significantly greater number of charges before age 17 than both control prisoners and primary psychopaths. Both psychopathy subtypes, however, exhibited a significantly earlier age of first charge than the control prisoners.

In regards to adult criminality, both psychopathy subtypes scored significantly higher on the criminal variety index than the control prisoners, but did not differ from each other. Primary psychopaths had a significantly greater number of official non-violent criminal charges than both the control prisoners and secondary psychopaths, while secondary psychopaths exhibited significantly more violent criminal charges than control prisoners. For self-reported non-violent crimes, both psychopathy subtypes reported engaging in more criminal activity than the control prisoners, but did not differ from one another.

Consistent with the theme of a tendency toward greater violence, a significantly higher proportion of secondary psychopaths were charged with violent institutional infractions than either control prisoners or primary psychopaths. A significantly higher proportion of secondary psychopaths were also charged with non-violent institutional infractions compared to control prisoners. Secondary psychopaths also reported engaging in significantly more fights during childhood and adulthood than control prisoners, and a greater proportion reported engaging in acts of violence against a romantic partner. Primary psychopaths also reported more fights in adulthood and greater violence against partners than control prisoners. Secondary psychopaths also reported engaging in more fights during childhood, but not during adulthood, than primary psychopaths.

Substance use and abuse—Table 5 presents descriptive statistics and group differences for measures of substance use and abuse. On the SADU, secondary psychopaths reported significantly greater use of nicotine, alcohol, marijuana, psychedelics, cocaine/crack, and

barbiturates than control prisoners, and significantly greater use of nicotine, alcohol, and marijuana than primary psychopaths. Primary psychopaths reported significantly greater use of barbiturates and opiates than control prisoners. In terms of overall substance use (i.e., SADU total score), secondary psychopaths reported significantly greater substance use than either primary psychopaths or control prisoners, and primary psychopaths reported significantly greater substance use than control prisoners.

In terms of symptoms of alcohol abuse and dependence, secondary psychopaths scored higher on both the SMAST (which assesses problems related to alcohol use) and the ADS (which assesses more severe pathology associated with alcohol dependence) than control prisoners, and higher on the ADS than primary psychopaths. Secondary psychopaths also scored higher on each drinking motive scale than control prisoners, and higher on the Coping and Enhancement motive scales than primary psychopaths. Primary psychopaths did not differ from control prisoners on any measure of alcohol use or abuse. Both psychopathy subtypes scored higher on the SDAST than control prisoners, indicating a greater incidence of drug abuse-related symptoms among members of the high-psychopathy groups.

Social background, education, and intelligence—The three prisoner groups did not differ in proportion of group members raised by a single parent. Additionally, the three prisoner groups did not differ in parental occupational status or maternal criminality. The proportion of secondary psychopaths who had a father with a criminal record was significantly higher than that of control prisoners. Secondary psychopaths also attained a significantly lower level of educational achievement than control prisoners. Finally, the three prisoner groups did not differ on the SIL measures of intellectual functioning.

Traumatic events, PTSD symptoms, and history of mental health treatment and suicide attempts—A significantly higher proportion of secondary psychopaths experienced childhood physical abuse than control prisoners, while a significantly greater proportion of primary psychopaths experienced childhood sexual abuse than control prisoners. The three prisoner groups did not differ in victimization of adult physical or sexual assault, with rates being high for all groups. Though the differences were not significant, the primary psychopath group included the highest proportion of members who had experienced childhood sexual abuse, adult sexual assault, and adult physical assault. As a consequence, primary psychopaths had significantly higher scores on the cumulative index of traumatic events than the control prisoners. Given the high rates of trauma, symptoms of PTSD were also common in the sample, with secondary psychopaths reporting significantly more past-month PTSD symptoms than the control prisoners and primary psychopaths.

Finally, we examined group differences on history of mental health treatment and prior suicide attempts. Secondary psychopaths exhibited the highest score on the index mental health treatment, which was significantly greater than the control prisoners. Additionally, a significantly greater proportion of secondary psychopaths exhibited a history of suicide attempts compared with primary psychopaths. Consistent with results for PTSD symptoms, primary psychopaths had the lowest rates of suicide attempts, though these rates did not differ significantly from that of control prisoners.[2]

[2]Regarding the effect of using higher PCL-R cutoff score on group differences, results indicate a loss of statistical power rather than a qualitative change in the pattern of group differences. If not noted below, all group differences remained significant after using the higher PCL-R scores. For a PCL-R cutoff score of 27 and 30, the primary and secondary subtypes were no longer significantly different for PCL-R F2, official non-violent criminal charges, or any of the substance use and abuse measures except the ADS; primary subtypes were no longer significantly different from control prisoners on Traditionalism; secondary subtypes were no longer significantly different from control prisoners for cocaine/crack use. For a PCL-R cutoff score of 30, the primary and secondary subtypes were no longer significantly different for Stress Reaction, Constraint, or suicide attempts; secondary subtypes were no longer significantly different from control prisoners for Social Closeness and Traditionalism.

Discussion

We replicated and extended findings on subtypes of psychopaths in male prisoners (Hicks et al., 2004; Skeem et al., 2007) by identifying and validating similar subtypes in psychopathic female prisoners. We identified two groups of female psychopaths on the basis of differences in personality structure with the most discriminating characteristic being constituent traits of NEM (stress reaction, alienation, aggression). Further comparisons between psychopathic subtypes and non-psychopathic prisoners on external validation criteria demonstrated that the two psychopathic groups were broadly consistent with conceptualizations of primary and secondary psychopathy.

Primary and Secondary Psychopathy in Female Prisoners

The psychopathic subtypes evinced markedly different personality structures despite the fact that each attained high PCL-R scores and exhibited exceptionally high levels of antisocial and criminal behavior. Relative to primary psychopaths, non-psychopathic prisoners, and the normative (non-prisoner) sample, the female secondary variant was distinguished by high NEM and low CON, a personality structure associated with externalizing disorders and poor global functioning (Krueger et al., 2000). This variant clearly corresponded to the secondary psychopathic subgroup identified in prior studies with male prisoners (Hicks et al., 2004; Skeem et al., 2007). Compared to non-psychopathic prisoners, secondary psychopaths exhibited various other differences including greater antisocial and criminal behavior—particularly that of an early onset and violent nature—polysubstance use and abuse, greater environmental adversity including childhood physical abuse, and greater mental health problems including PTSD.

The secondary psychopathy subtype (for both men and women) is similar to an externalizing variant of borderline personality disorder (BPD; Bradley et al., 2005; Shevlin et al., 2007; Whewell et al., 2000). Similar to BPD, secondary psychopathy is characterized by extreme negative affect and impulsivity; reactive anger, aggression, and violence; substance abuse; trauma and PTSD; and suicidal behavior (Trull, 2001). The overlap between these clinical constructs is likely due to a similar personality structure, particularly high NEM and low CON (Lynam & Widiger, 2001; Trull et al., 2003). Also, traumatic events are linked with PTSD and BPD (Herman, 1992; Zanarini et al., 1998), as is alcohol dependence (Kilpatrick et al., 2000; Trull et al., 2000). Additionally, secondary psychopaths scored high on the personality trait of Absorption, consistent with evidence for dissociative experiences in both PTSD and BPD (Davidson & Foa, 1991; Herman, 1992; Lauer et al., 1993).

In contrast, female primary psychopaths exhibited few distinguishing personality features in terms of MPQ-BF scores relative to the normative and non-psychopathic prisoner groups. Similar to male primary psychopaths (Hicks et al., 2004), the personality style of the female primary group was not especially deviant (at least as measured via self-report) indicative of psychopathology, but it lacked the high agency and especially low stress reaction characteristic of male primary psychopaths. In terms of subtype differences, female primary and secondary psychopaths differed on several important variables including onset of antisocial behavior, patterns of substance use, and mental health. Primary psychopathy was associated with an adult onset of criminal and antisocial behavior, while secondary psychopaths tended to exhibit a childhood onset. Primary psychopathy exhibited relatively modest associations with drug use and abuse (limited to “downers”, i.e., barbiturates and tranquilizers). In contrast, secondary psychopathy was strongly associated with heavy use of multiple drug classes (especially alcohol, nicotine, and marijuana) as well as severe abuse and dependence, particularly for alcohol. Finally, the primary psychopathy group exhibited evidence of psychological resiliency compared with the secondary group including fewer

suicide attempts and PTSD symptoms, despite experiencing a comparable number of traumatic events.

It is important to consider methodological explanations for the relatively benign personality profile exhibited by this female psychopathy subgroup. One might be using the lower PCL-R total score cutoff for psychopathy. Supplemental analyses that used higher cutoffs on the PCL-R and a mixed-gendered prisoner sample, however, yielded a similar 2-cluster solution. Further, female primary psychopaths exhibited severe behavioral pathology characteristic of psychopathy as evidenced by PCL-R facet scores that were comparable to secondary psychopaths and dramatically elevated relative to the non-psychopathic prisoners. Additionally, relative to control prisoners, female primary psychopaths exhibited high levels criminality, adult and child antisocial behavior, and interpersonal aggression.

A second methodological explanation is that the current results might be due to invalid self-report data. Arguing against this is the fact that the primary psychopathy group did not differ from the non-psychopathic or secondary psychopathic groups on any of the MPQ-BF validity scales. That is, individuals in this group were no less consistent in their responses and showed no greater tendency toward positive impression management. Also, previous reports have demonstrated the overall validity of the personality data in this sample as evidenced by MPQ-BF scores exhibiting a meaningful pattern of convergent and discriminant associations with external criterion variables (Kennealy et al., 2007), and the ability to account for interrelations among some of these criterion variables (e.g., between PCL-R F2 and history of suicide attempts; Verona et al., 2005).

The weight of evidence then indicates that our finding of two female psychopathic subgroups with markedly different personality profiles—one relatively benign, and the other markedly deviant—cannot readily be explained by methodological factors. The combination of valid but relatively normal personality scores in the primary group alongside high PCL-R scores and prolific criminality calls for an explanation as to why such a diagnostically deviant group can in some ways appear psychologically normative—a question embodied in Cleckley's (1976) notion of a "mask of sanity." Thus, more substantive explanations are considered below, following a discussion of gender differences in personality profiles for primary versus secondary psychopaths.

Differences between Male and Female Psychopathy Subtypes

While the psychopathic subtypes detected in female prisoners were generally consistent with previous studies in male prisoners, certain gender differences were also notable. The first has already been discussed, namely that the personality structure of female primary psychopathy was neither as distinctive nor as indicative of good adjustment relative to male primary psychopathy (Hicks et al., 2004). A second notable difference is that female secondary psychopaths appear even more psychologically maladjusted than male secondary psychopaths as evidenced by the more extreme scores on the MPQ-BF personality trait scales. That is, the mean absolute value of Cohen's *d* relative to the same normative sample was 1.86 and .68 for female and male secondary psychopaths, respectively (Hicks et al., 2004). Though we can only speculate, we believe two factors help account for these gender differences in psychopathic subtypes: 1) mean-level gender differences in personality, and 2) greater levels of psychopathology in female relative to male prisoners.

In terms of mean-level gender differences in personality, women score higher on measures of stress reaction and behavioral constraint, and lower on measures of agency and aggression relative to men (Blonigen et al., 2008; Roberts et al., 2001). On the basis of these mean-level gender differences, then, one would predict that female primary psychopaths would not score as low on stress reaction or as high on agency as male primary psychopaths.

One would also predict that female secondary psychopaths would not score as high on aggression or as low on behavioral constraint as male secondary psychopaths. If a gender bias is also present such that women who are incarcerated tend to exhibit greater psychopathology and poorer global functioning relative to their male counterparts (Maden et al., 1994; McClellean et al., 1997; Mulder et al., 1994; Teplin et al., 2002), however, the personality differences between male and female psychopathic subtypes will be further shifted. Specifically, the personality structure of female psychopaths will be shifted toward more pathological and less adaptive tendencies such that female primary psychopaths will be even less distinctive on stress reaction (-) and agency (+) relative to male primary psychopaths while female secondary psychopaths will be more deviant on NEM (+) and CON (-) such that their scores may surpass those of male secondary psychopaths despite the initial gender-based "advantage."

Another gender differences in personality was that all female prisoner groups differed from the normative sample on Absorption, which was the only trait that failed to distinguish any of the male prisoner groups (Hicks et al., 2004). Absorption is a risk factor for dissociative symptoms (Carlson & Putnam, 1993; Herman, 1992; Van Ijzendoorn & Schuengel, 1996), and may contribute to the comorbidity among secondary psychopathy, BPD, and PTSD. Notably, female primary psychopaths scored significantly lower on Absorption than other prisoner groups, and also experienced the fewest PTSD symptoms and suicide attempts despite substantial exposure to traumatic events. Finally, consistent with male prisoners, all female prisoner groups had high scores on Alienation. Heightened mistrust and suspiciousness may be a generally associated with incarceration, though prospective analyses are needed to determine the causal direction of this association.

Alternative Etiological Pathways to Antisocial and Criminal Behavior

The findings have several practical and theoretical implications. In terms of theory, findings on psychopathic subtypes converge with findings of the differential correlates of psychopathic trait dimensions (e.g., PCL-R F1 and F2), which points to alternative etiological processes evident in personality structure that serve as different pathways to same phenotypic outcome of antisocial and criminal behavior. Secondary psychopathy is one manifestation of a process associated with an impulsive-aggressive behavioral style that is underpinned by weaknesses in neurobiological inhibitory control systems (Fowles & Dindo, 2006; Patrick & Bernat, in press). Some researchers have argued that deficits in fear reactivity underlie the temperamental vulnerability for primary psychopathy (Fowles & Dindo, 2006; Patrick & Bernat, in press) as evidenced by low stress reaction and high agency and deficient fear-enhanced startle as consistently observed in male prisoners with either high PCL-R total or F1 scores (Patrick, 1994; for a review see Patrick & Bernat, in press). Relevant to this, Sutton et al. (2002) reported deficient fear reactivity in a subgroup of female prisoners with high PCL-R total scores with low scores on a measure of NEM. However, given that the primary subtype in the current sample failed to exhibit a particularly distinct personality structure in terms of high agency and low stress reaction, female prisoner samples may not be ideal for identifying female psychopaths who would exhibit deficiencies in fear reactivity.

In terms of practical implications, our findings show all female prisoners with high PCL-R scores are not of equal concern regarding institutional management, need for mental health services, and risk to self and others. Female secondary psychopaths are more likely to fail to follow institutional rules and engage in violent behavior with staff and other inmates. Female secondary psychopaths also exhibit greater mental health problems in particular PTSD, substance abuse, and history of suicide attempts. As such, female secondary psychopaths will require greater mental health services for these problems. Also, the differences in personality structure suggest differences of focus for treatment. For example,

a common focus of treatment for female secondary psychopaths would be on reducing and developing more effective strategies for coping with negative emotional states, particularly anger. Employing assessment techniques that utilize the primary-secondary distinction could be useful in both identifying prisoners of greater risk and need of services, and in tailoring specific interventions.

To conclude, the current investigation extended conceptualizations of psychopathic subtypes by replicating previous findings in male prisoners and providing a descriptive account of psychopathic subtypes in female prisoners. However, the study has notable limitations. For one, our interpretations of observed gender differences in primary and secondary psychopathy are speculative and need to be evaluated directly in future work. In addition, we relied heavily on behavioral criteria to distinguish psychopathic subtypes. Future studies that utilize quasi-experimental designs to distinguish female psychopathic subtypes on the basis of physiological responses such as emotion-modulated startle and event-related brain potentials would provide further clues regarding the mechanisms underlying these alternative phenotypic variants (Patrick & Bernat, in press). Longitudinal studies that track the development of these personality subtypes would also be valuable. Finally, while the subtype approach suggests clear clinical utility, it requires further validation, for example, demonstrating prospective associations with clinical outcomes and cost-effectiveness relative to standard practices.

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Table 1

Bayesian Information Criterion (BIC) Values for Alternative Models.

Cluster Characteristics				Number of Clusters								
Model	**Volume**	**Shape**	**Orientation**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
EII	equal	spherical	-	-5687	**-5615**	-5618	-5638	-5675	-5699	-5724	-5769	-5809
VII	variable	spherical	-	-5687	**-5614**	-5626	-5647	-5679	-5718	-5744	-	-
EEI	equal	equal	coordinate axes	-5697	-5640	-5638	-5662	-5702	-5733	-5770	-5791	-5832
VEI	variable	equal	coordinate axes	-5697	-5637	-5661	-5670	-5700	-5748	-5774	-	-
EVI	equal	variable	coordinate axes	-5697	-5660	-5689	-5723	-5822	-5874	-5956	-	-
VVI	variable	variable	coordinate axes	-5697	-5658	-5711	-5740	-5826	-5895	-5954	-	-
EEE	equal	equal	equal	-5730	-5759	-5783	-5809	-5816	-5842	-5903	-5930	-5968
EEV	equal	equal	variable	-5730	-5886	-6061	-6230	-6340	-6372	-6349	-	-
VEV	variable	equal	variable	-5730	-5906	-6080	-6230	-6319	-6337	-6458	-	-
VVV	variable	variable	variable	-5730	-5940	-6129	-6315	-	-	-	-	-

Note. Values represent BIC values; greater values (less negative) indicate better fit. The best-fitting model is in bold. BIC values have been rounded to the nearest whole number. Shape, Volume, and Orientation refer to the geometric characteristics of the clusters' distributional shape in multivariate space. Shape is proportional to the relative magnitudes of the eigenvalues of each cluster's covariance matrix. Volume is proportional to the absolute magnitude of the variances and covariances of the covariance matrix. Orientation is specified by the eigenvectors of the covariance matrix. Spherical refers to the assumption that the covariance matrix of each cluster is diagonal with constant variance across variables. The dashes in the rows for Models 1and 2 indicate that because there are no off-diagonal elements, an orientation parameter cannot be estimated. The dashes in the rows for Models 2, 4, 5, 6, 8, 9 and 10 indicate that the sample was inadequate to estimate the fit of these models.

Table 2

Personality Differences Between Female Psychopathy Subtypes and Control Prisoners

		Psychopathy Subtypes		*p* values for Tukey's post hoc comparisons		
MPQ-BF scale	**Control (*n* =70)**	**Primary (*n* =31)**	**Secondary (*n* = 39)**	**Primary vs. Control**	**Secondary vs. Control**	**Secondary vs. Primary**
Primary scale Well-Being						
M	50.9	48.6	48.9			
SD	9.7	9.2	9.3			
d	.09	-.15	-.11			
Social Potency						
M	50.4	51.2	54.6		.021	
SD	7.7	8.5	7.8			
d	.04	.13	**.51**		**.54**	
Achievement						
M	53.5	49.7	52.0			
SD	8.2	8.5	8.6			
d	**.38**	-.03	.21			
Social Closeness						
M	45.9	44.6	39.1		.004	
SD	10.9	10.4	7.9			
d	**-.39**	**-.53**	**-1.21**		**-.71**	
Stress Reaction						
M	48.2	46.3	60.3		< .001	< .001
SD	10.3	9.3	5.5			
d	-.18	**-.38**	**1.28**		**1.47**	**1.83**
Alienation						
M	58.9	58.8	68.4		< .001	< .001
SD	9.5	10.0	5.3			
d	**.91**	**.88**	**2.30**		**1.24**	**1.20**
Aggression						
M	47.5	46.2	66.0		< .001	< .001
SD	9.1	7.2	8.7			
d	-.26	**-.44**	**1.71**		**2.08**	**2.48**

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		Psychopathy Subtypes		*p* values for Tukey's post hoc comparisons		
MPQ-BF scale	**Control (*n* =70)**	**Primary (*n* =31)**	**Secondary (*n* = 39)**	**Primary vs. Control**	**Secondary vs. Control**	**Secondary vs. Primary**
Control						
M	50.9	50.0	40.7		< .001	< .001
SD	8.3	9.9	8.7			
d	.10	.00	**-.99**		**-1.20**	**-1.00**
Harm Avoidance						
M	50.5	51.6	47.9			
SD	9.4	8.5	8.9			
d	.05	.17	-.22			
Traditionalism						
M	53.1	48.6	47.9	.039	.009	
SD	8.3	8.2	5.9			
d	.34	-.15	-.26	**-.55**	**-.72**	
Absorption						
M	53.5	46.0	56.9	< .001		< .001
SD	8.5	8.3	7.5			
d	**.38**	**-.44**	**.78**	**-.89**		**1.38**
Higher-order scale Agentic-PEM						
M	53.0	50.1	53.2			
SD	8.2	9.0	8.3			
d	.33	.01	.35			
Communal-PEM						
M	46.8	46.4	43.3			
SD	10.5	11.0	7.5			
d	-.31	-.34	**-.76**			
Negative Emotionality						
M	52.2	51.1	69.6		< .001	< .001
SD	11.3	11.0	4.9			
d	.21	.10	**2.49**		**2.00**	**2.17**
Constraint						
M	52.1	49.7	43.7		< .001	.008

		Psychopathy Subtypes		*p* values for Tukey's post hoc comparisons		
MPQ-BF scale	**Control (*n* =70)**	**Primary (*n* =31)**	**Secondary (*n* = 39)**	**Primary vs. Control**	**Secondary vs. Control**	**Secondary vs. Primary**
SD	9.1	8.1	7.3			
d	.22	-.03	**-.72**		**-1.02**	**-.78**

Note. MPQ-BF = Multidimensional Personality Questionnaire—Brief Form; PEM = Positive Emotionality. Personality scores are *T* scores scaled to the normative sample (i.e., *M* = 50, *SD* = 10). *d* = the standardized difference from the mean of the normative sample and can be interpreted as the effect size. The ds greater than .37 are in bold; this is the effect size needed to detect a significant difference between the primary psychopathy group and the normative sample at α = .05, two-tailed (Cohen, 1988). For post host tests, only protected *p* values < .05 are reported.

Table 3

Group Differences on Measures of Psychopathy and Antisocial Personality Disorder.

	Control (*n* = 70) *M* (*SD*)	Primary (*n* = 31) *M* (*SD*)	Secondary (*n* = 39) *M* (*SD*)	Effect Sizes for Group Differences (*d*)		
				Primary vs Control	Secondary vs Control	Secondary vs Primary
PCL-R						
Total	11.2 (4.2)	28.6 (3.4)	29.3 (2.7)	4.55***	5.13***	
Factor 1	4.6 (2.6)	12.1 (2.3)	11.5 (2.1)	3.06***	2.92***	
Factor 2	5.4 (2.6)	12.7 (1.7)	13.9 (1.9)	3.32***	3.73***	.67*
Interpersonal	2.4 (1.5)	6.2 (1.4)	5.8 (1.4)	2.62***	2.34***	
Affective	2.2 (1.6)	5.9 (1.4)	5.7 (1.5)	2.46***	2.26***	
Lifestyle	4.1 (1.7)	8.4 (1.0)	8.5 (0.9)	3.08***	3.23***	
Antisocial	1.3 (1.2)	4.2 (1.5)	5.4 (1.9)	2.14***	2.58***	.70**
APD symptoms						
Child	1.0 (1.3)	3.0 (2.0)	4.5 (2.5)	1.19***	1.76***	.66**
Adult	2.7 (1.4)	5.5 (0.9)	5.9 (0.8)	2.38***	2.81***	

Note.

* $p < .05$;

** $p < .01$;

*** $p < .001$.

For effect sizes of group differences, comparisons are based on post host tests using Tukey's procedure. Only comparisons with protected *p* values < .05 are reported.

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Table 4

Group Differences on Measures of Criminality, Institutional Misconduct, and Interpersonal Aggression

				Effect Sizes for Group Differences (*d*)		
	Control (*n* = 70) *M* (*SD*)	**Primary (*n* = 31) *M* (*SD*)**	**Secondary (*n* = 39) *M* (*SD*)**	**Primary vs Control**	**Secondary vs Control**	**Secondary vs Primary**
Age of Onset Criminal Behavior						
Charges before age 17	.10 (0.4)	.10 (0.3)	2.2 (4.4)		.67***	.67**
Age of first charge	26.0 (7.1)	20.8 (5.7)	18.9 (4.3)	-.81**	-1.21***	
Criminal Variety Index	1.8 (1.1)	3.5 (1.4)	3.5 (1.8)	1.35***	1.14***	
Nonviolent Crime						
Official charges	4.3 (5.3)	12.3 (11.8)	7.7 (5.6)	.87***		-.50*
Self-reported	0.7 (0.7)	1.8 (1.2)	1.7 (1.0)	1.12***	1.16***	
Violent Crime	.80 (1.5)	1.8 (1.8)	2.9 (4.8)		.59**	
Institutional Charges						
Nonviolent (%)	40.9	44.8	64.9		.54*	
Violent (%)	7.6	6.9	35.1		1.04***	1.10***
Interpersonal Aggression						
Child fights	1.7 (4.3)	4.0 (5.8)	7.4 (7.2)		.96***	.52*
Adult fights	1.6 (3.4)	4.5 (5.7)	5.9 (6.2)	.62*	.86***	
Violence against partner (%)	51.4	87.1	79.5	1.02***	.72**	

Note.

* $p < .05$;

** $p < .01$;

*** $p < .001$.

For effect sizes of group differences, comparisons are based on post host tests using Tukey's procedure. Only comparisons with protected *p* values < .05 are reported.

Table 5

Group Differences on Measures of Substance Use and Abuse

	Control (*n* = 70) *M* (*SD*)	Primary (*n* = 31) *M* (*SD*)	Secondary (*n* = 39) *M* (*SD*)	Effect Sizes for Group Differences		
				Primary vs Control	Secondary vs Control	Secondary vs Primary
Survey of Alcohol and Drug Use						
Total	-.26 (0.4)	.03 (0.6)	.36 (0.6)	.57*	1.22***	.55*
Nicotine	-.24 (0.8)	-.13 (0.8)	.49 (1.3)		.68**	.57*
Alcohol	-.28 (1.1)	-.27 (0.7)	.42 (1.1)		.64**	.75*
Marijuana	-.35 (1.0)	-.26 (0.7)	.55 (1.0)		.90***	.94**
Psychedelics	-.25 (0.3)	.04 (0.9)	.39 (1.7)		.52*	
Amphetamines	-.17 (0.9)	.13 (1.1)	.33 (1.3)			
Cocaine/Crack	-.19 (1.0)	-.14 (0.6)	.39 (1.3)		.50*	
Barbiturates	-.27 (0.4)	.31 (1.3)	.21 (1.3)	.60*	.50*	
Tranquilizers	-.25 (0.6)	.24 (1.3)	.24 (1.2)			
Opiates	-.24 (0.6)	.38 (1.3)	.23 (1.2)	.61*		
Short Michigan Alcohol Screening Test	2.2 (2.3)	2.8 (2.6)	3.8 (3.2)		.57**	
Alcohol Dependence Scale	4.0 (5.5)	5.3 (6.7)	12.8 (11.5)		.98***	.80***
Drinking Motives Questionnaire						
Social	9.1 (3.7)	10.8 (4.0)	11.8 (4.4)		.66**	
Coping	7.7 (4.2)	8.3 (4.6)	11.3 (5.2)		.76***	.61*
Enhancement	7.6 (3.7)	9.6 (5.1)	12.2 (4.8)		1.07***	.53*
Short Drug Abuse Screening Test	4.9 (5.3)	8.3 (6.4)	10.3 (5.3)	.58*	1.02***	

Note.

* $p < .05$;

** $p < .01$;

*** $p < .001$.

Values for the Survey of Alcohol and Drug Use scales are z-scores based on the larger female prisoner sample (N =226) from which participants for the current investigation were drawn. For effect sizes of group differences, comparisons are based on post host tests using Tukey's procedure. Only comparisons with protected p values < .05 are reported.

Table 6

Group Differences on Measures of Social Background, Education, and Intellectual Functioning.

				Effect Sizes for Group Differences (*d*)		
	Control (*n* = 70) *M* (*SD*)	**Primary (*n* = 31) *M* (*SD*)**	**Secondary (*n* = 39) *M* (*SD*)**	**Primary vs Control**	**Secondary vs Control**	**Secondary vs Primary**
Raised by single parent (%)	35.7	54.8	53.8			
Occupation of Parents						
Mother	5.5 (1.8)	5.3 (1.9)	5.8 (1.4)			
Father	5.2 (1.7)	5.2 (2.0)	5.4 (1.5)			
Criminality of Parents						
Mother (%)	10.9	20.7	23.1			
Father (%)	22.0	24.0	48.6		.67**	
Education	4.5 (1.2)	5.1 (1.0)	5.3 (1.0)		-.72**	
Shipley Institute of Living						
Verbal score	23.5 (5.6)	26.3 (3.5)	24.1 (4.6)			
Abstraction score	24.1 (8.8)	25.9 (6.0)	24.6 (8.9)			
Estimated IQ	91.5 (11.9)	95.6 (7.0)	91.4 (12.1)			

Note.

* $p < .05$;

** $p < .01$;

*** $p < .001$.

For effect sizes of group differences, comparisons are based on post host tests using Tukey's procedure. Only comparisons with protected *p* values < .05 are reported.

Table 7

Group Differences on Measures of Traumatic Experience, PTSD symptoms, Mental Health Treatment, and Suicide Attempts.

				Effect Sizes for Group Differences (*d*)		
	Control (*n* = 70) *M* (*SD*)	**Primary (*n* = 31) *M* (*SD*)**	**Secondary (*n* = 39) *M* (*SD*)**	**Primary vs Control**	**Secondary vs Control**	**Secondary vs Primary**
Trauma History						
Physical abuse (%)	17.1	29.0	41.0		.67**	
Sexual abuse (%)	25.7	48.4	43.6	.55*		
Physical assault (%)	50.0	64.5	63.2			
Sexual assault (%)	21.4	35.5	20.5			
Cumulative trauma exposure	1.1 (1.0)	1.8 (1.3)	1.7 (1.2)	.60*		
PTSD symptoms	2.0 (0.9)	1.9 (0.8)	2.7 (0.8)		.82***	1.00***
Mental Health Treatment	1.0 (1.1)	1.4 (1.4)	1.7 (1.2)		.61*	
Suicide attempt (%)	22.9	9.7	38.5			.97**

Note.

* $p < .05$;

** $p < .01$;

*** $p < .001$.

For effect sizes of group differences, comparisons are based on post host tests using Tukey's procedure. Only comparisons with protected p values < .05 are reported.