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# Identifying Psychopathy Subtypes on the Basis of Personality Structure

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The authors used model-based cluster analysis to identify subtypes of criminal psychopaths on the basis of differences in personality structure. Participants included 96 male prisoners diagnosed as psychopathic, using the Psychopathy Checklist Revised (PCL–R; R. D. Hare, 1991). Personality was assessed using the brief form of the Multidimensional Personality Questionnaire (MPQ–BF; C. J. Patrick, J. J. Curtin, & A. Tellegen, 2002). The best-fitting model yielded two clusters. *Emotionally stable* psychopaths were characterized by low Stress Reaction and high Agency. *Aggressive* psychopaths were characterized by high Negative Emotionality, low Constraint, and low Communion. These results suggest that psychopaths as defined by the PCL–R includes distinct subtypes, distinguishable in terms of personality structure, that may reflect different etiologies.

The question of whether there are subtypes of psychopaths is a long-standing but empirically understudied topic in the psychopathy literature (Lykken, 1995). Most existing research on psychopathy consists of experimental psychopathology studies, in which the emphasis has been on selecting homogeneous groups in order to test for differences on variables of interest. However, if individuals can gain membership in a phenotypic group as a function of differing etiologies, heterogeneity will arise and group differences may fail to materialize. For example, a notable inconsistency in the experimental literature is that individuals who are either at risk or exhibit antisocial behavior and substance disorders show reliable deficits on tasks of executive function (Morgan & Lilienfeld, 2000) and reductions in brain potential (P300) response to rare target stimuli (e.g., Bauer, O'Connor, & Hesselbrook, 1994), whereas consistent findings for these measures have failed to emerge in the psychopathy literature, despite substantial comorbidity with these disorders (Hare, 1984; Hart, Forth, & Hare, 1990; Raine, 1989).

A potential explanation for this inconsistency could be that clinically diagnosed psychopaths are a heterogeneous group, resulting in the obscuring of differences that would be detected if a more refined classification were available. In this investigation, we sought to identify subtypes of psychopaths on the basis of differences in basic dimensions of personality that could then be used to generate hypotheses relating to possible etiological differences.

## Background and Conceptualization

Cleckley (1941/1988) is credited with the first comprehensive description of psychopathy, and he explicitly distinguished the psychopath from the ordinary criminal offender. Although Cleckley's criteria included indicators of behavioral disinhibition (e.g., unreliability, poor judgment, unmotivated antisocial behavior), he focused on the affective (lack of remorse or shame, egocentricity and incapacity for love, general poverty of affect) and interpersonal (untruthfulness, superficial charm, unresponsiveness in interpersonal relations) features of the syndrome. Hare (1980) operationalized Cleckley's criteria by developing the Psychopathy Checklist (now in revised form, PCL–R; Hare, 1991). Because Hare worked with correctional populations, criteria dealing explicitly with criminal behavior (e.g., juvenile delinquency, revocation of conditional release, criminal versatility) are included in this instrument. The PCL–R has shown incremental validity over offense history, personal background variables, and the diagnosis of antisocial personality disorder (APD; American Psychiatric Association, 1994) in predicting recidivism, number of crimes committed, and violent criminality (Harpur, Hare, & Hakstian, 1989; Hart & Hare, 1989; Kosson, Smith, & Newman, 1990), and it has become the standard for assessing psychopathy in both research and forensic settings.

Factor analyses of the PCL–R items across a variety of samples have revealed two stable, correlated factors (Hare et al., 1990; Harpur et al., 1989; although see Cooke & Michie, 2001, for an alternative three-factor structure). Factor 1 is composed of items that assess the interpersonal and affective traits of psychopathy (e.g., callousness and manipulativeness), and Factor 2 reflects the chronically unstable and socially deviant lifestyle associated with psychopathy (e.g., impulsivity, irresponsibility, aggression) and is

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substantially correlated with the criteria for APD. A consistent finding in the psychopathy literature is that, after controlling for their common variance, the PCL–R factors exhibit divergent relations with a variety of external criterion measures. For example, Factor 1 is negatively correlated with measures of anxiety, neuroticism, and negative emotionality, whereas Factor 2 shows positive relations with these variables (Frick, Lilienfeld, Ellis, Loney, & Silverthorn, 1999; Hare, 1991; Harpur et al., 1989; Patrick, 1994; Verona, Patrick, & Joiner, 2001; although see Schmitt & Newman, 1999, for an exception). Factor 2 is positively correlated with impulsivity, sensation seeking, and anger and is negatively correlated with conscientiousness and constraint, whereas Factor 1 shows no significant association with these traits (Hare, 1991; Harpur et al., 1989; Patrick, 1994; Verona et al., 2001). Alcohol and drug abuse or dependence disorders are elevated in individuals who score high on the PCL–R, but Factor 2 accounts entirely for this relationship (Smith & Newman, 1990). Rates of suicide attempts are also elevated in high PCL–R scorers, and this association is mediated by personality traits common to both suicide history and Factor 2 (Verona et al., 2001).

Typological approaches have been proposed as alternatives to conceptualizing psychopathy in terms of correlated dimensions. The most well known is the primary versus secondary psychopath distinction (Blackburn, 1975; Karpman, 1941; Lykken, 1957, 1995; see also Skeem, Poythress, Edens, Lilienfeld, & Cale, 2003, for a recent review). Initially, the typology was meant to distinguish between antisocial behaviors that were motivated by a lack of conscience (*primary psychopathy*) versus the expression of neurotic conflict (*secondary psychopathy*; Karpman, 1941). Later, Fowles (1980, 1993) elaborated and applied Gray's (1987) neurobehavioral motivation theory to psychopathy, postulating that primary psychopathy was due to a weak behavioral inhibition system, resulting in a fearless temperament, whereas secondary psychopathy was due to an overactive behavioral activation system, resulting in impulsivity. Both type of psychopaths are likely to engage in antisocial behavior. The antisocial behavior of the primary psychopath, however, is unlikely to be accompanied by emotional arousal. In contrast, the secondary psychopath, who has a normal threshold for the experience of emotional arousal, may actually experience greater emotional distress than psychopaths because of the consequences of his or her impulsive behavioral style (Lykken, 1995).

It is interesting to note that the descriptive features of primary and secondary psychopathy mirror the psychometric correlates of PCL–R Factors 1 and 2, respectively. Blackburn (1975, 1996) has provided empirical support for the primary–secondary typology by using cluster analytic techniques to classify members of institutionalized populations on the basis of their Minnesota Multiphasic Personality Inventory (Hathaway & McKinley, 1942) profiles. Blackburn's analyses have consistently yielded two clusters that he has labeled "primary" and "secondary" psychopaths. Both groups were characterized as impulsive, aggressive, and undersocialized, but primary psychopaths scored low on anxiety and guilt whereas secondary psychopaths scored high on anxiety, withdrawal, and emotionality. Lykken (1957) reported deficits in avoidance learning and lower skin conductance to anxiety-provoking situations among primary psychopaths. Additionally, Newman and colleagues (e.g., Newman & Schmitt, 1998; Newman, Schmitt, & Voss, 1997) have highlighted differences in laboratory task performance (e.g., go/no-go task, response perseveration, lexical decision making) between criminal psychopaths who score low versus high on the Welsh Anxiety Scale (WAS; Welsh, 1956), a self-report measure of trait anxiousness.

Given the parallels between the correlates of the PCL–R factors and characteristics of primary versus secondary psychopaths, a tenable hypothesis is that the two PCL–R factors reflect related but separable psychopathologies (Patrick, in press). An analogous phenomenon in the psychopathology domain is that of anxiety and depressive disorders, which represent correlated but distinct syndromes (Mineka, Watson, & Clark, 1998). Divergence between the two PCL–R factors is most clearly evident when the variance unique to each factor is examined in relation to external criteria. The existence of "cooperative suppressor" effects of this kind (cf. Lilienfeld, 1994) raises the possibility that simple correlational strategies may mask important differences between the two facets of psychopathy.

A typological approach that uses relevant criterion measures external to the PCL–R (e.g., basic personality traits) provides one potentially useful strategy for delineating these differences. An approach of this kind can potentially account for the diverging correlates of the PCL–R factors by demonstrating evidence of distinct dispositional subtypes that exhibit overlap in terms of phenotypic symptoms (McHoskey, Worzel, & Szyarto, 1998). The emphasis of this approach is on referencing the construct of psychopathy to a broader nomological network (e.g., a structural model of personality), allowing for generation of unique hypotheses concerning its two facets. Additionally, few studies have used rigorous quantitative methods to identify subtypes of psychopaths. Even Blackburn's (1975, 1996) analyses did not directly address the issue of psychopathic subtypes; rather, he identified groups of prison inmates or psychiatric inpatients who exhibited some traits associated with the prototypical psychopath. Whether these same clusters would be present in a sample of clinically diagnosed psychopaths has yet to be examined (although see Blackburn & Coid, 1999, who identify personality subtypes of violent offenders, many of whom were psychopathic as rated by the PCL).

The current study was designed to fill this gap in the literature by using a well-validated clinical instrument, the PCL–R, to diagnose psychopathy and by using an innovative statistical technique, *model-based* cluster analysis, to identify psychopathy subtypes on the basis of personality trait scores. In model-based cluster analysis, statistical models are fit to the data via maximum likelihood and a goodness-of-fit index is used to evaluate how well the model captures the structure of the data (Banfield & Raftery, 1993). This represents an advance over traditional cluster analytic methods (e.g., Ward's method, *k* means), because the central problems of determining number of clusters and the optimal clustering procedure are simultaneously resolved by selecting the best-fitting model (Banfield & Raftery, 1993).

Our use of a personality-based approach to differentiate psychopaths rests on the assumption that personality disorders can be conceptualized as distinct configurations of extreme scores on normative personality traits (Widiger, 1993; Widiger & Costa, 1994). Recent research supports the applicability of this approach to psychopathy (Lynam, 2002; Miller, Lynam, Widiger, & Leukefeld, 2001). To be successful, such an analysis requires not only adequate coverage of the broad domain of personality (bandwidth) but also the ability to make fine distinctions (fidelity). To achieve

this, we used the Multidimensional Personality Questionnaire (in brief form; MPQ–BF; Patrick, Curtin, & Tellegen, 2002), an instrument that assesses a wide range of basic trait constructs in the personality literature, with an emphasis on discriminant validity. We hypothesized that the best-fitting model would contain two clusters: (a) one low in trait anxiety and resembling descriptions of the primary psychopath and (b) another high on anxiety, impulsivity, and aggression and resembling descriptions of secondary psychopath.

Additionally, scores on a range of external criterion measures were available for a sizable portion of the sample, which allowed us to investigate the validity of subtypes indicated by the model-based cluster analysis. Specifically, we anticipated that subtype differences would parallel the differential correlates of the PCL–R factors, such that one subtype would exhibit more indicants of behavioral disinhibition (e.g., more violent and higher levels of substance abuse) whereas the other subtype would exhibit lower levels of subjective anxiety and score higher on measures of adaptive functioning (e.g., intellectual ability).

## Method

### *Participants*

Study participants were selected from a larger pool of inmates ($N = 542$) recruited from two separate research sites, a low-medium security federal prison in Florida ($n = 240$) and a high-medium security federal prison in Wisconsin ($n = 301$). All participants were assessed for psychopathy, using the PCL–R. Personality data in the form of scores on the 155-item MPQ–BF were also available for all participants. From among the complete valid MPQ–BF protocols ($n = 487$; see below), two prisoner samples were selected for study: a psychopathic and a comparison sample consisting of individuals low in psychopathy (i.e., control group). The criterion for inclusion in the psychopathic sample was a total PCL–R score of 30 or more out of a possible 40, the cutoff typically used for a diagnosis of psychopathy (Hare, 1991). Participants in this sample ($N = 96$) included 46.7% ($n = 45$) African Americans, 50.0% ($n = 48$) Caucasians, and 3.3% ($n = 3$) Hispanics, with a mean age of 31.1 years ($SD = 6.7$, range = 18–55). The prisoner control group consisted of 125 inmates with scores at or below the midpoint on the PCL–R as a whole (i.e., total score 20) and each of its factors. The mean age of participants in the control group was 30.1 years ($SD = 7.3$). The psychopath group did not differ from the nonpsychopathic control group in terms of racial composition or mean age.

### *Assessment*

*Psychopathy.* Ratings on the PCL–R were assigned on the basis of information collected in a semistructured interview and from a review of prison file information. For both samples, interviewers were either bachelor's or master's level psychology students who received specialized training in administering and scoring the PCL–R. For the Florida sample, all interviews were videotaped and watched by a second diagnostician, who made independent ratings based on the videotaped interview and prison file information. For the Wisconsin sample, a second diagnostician sat in on some interviews ($n = 42$) and completed ratings independently after reviewing file information. Interrater reliability for PCL–R total scores, on which psychopathy diagnoses were based, was evaluated using the intraclass correlation coefficient (Shrout & Fleiss, 1979). For the sample as a whole, the single rater coefficient was .90 and the coefficient for the mean of two raters was .95. For the Florida sample, coefficients were .91 and .95, respectively; for the Wisconsin sample, they were .77 and .87, respectively. Mean PCL–R scores for the psychopathic and nonpsychopathic prisoner groups were 32.4 ($SD = 2.1$, range = 30.0–39.0) and 13.0 ($SD = 3.7$, range = 3.0–20.0), respectively.

*Personality.* The personality variables on which cluster analyses were performed were the primary trait scales of the MPQ–BF. The MPQ–BF was developed to preserve the coverage and structure of the full MPQ while greatly reducing its overall length (for details, see Patrick et al., 2002). Standard (T) scores and invalidity criteria for the MPQ–BF were developed with reference to data for a large adult normative sample consisting of 675 men and 675 women recruited from the community (mean age = 40.3 years; range = 18–70 years; Patrick et al., 2002; see also Tellegen, in press). For purposes of reporting, we converted the raw scores of prisoner participants on each MPQ scale to T scores relative to the normative sample (i.e., on each MPQ variable, the normative sample was scaled to have a mean of 50 and standard deviation of 10). This permitted comparisons to be made between the personality trait scores of prisoners and those of adults in the general population, as well as permitting straightforward comparisons between prisoner subgroups.

The MPQ–BF was developed by using an iterative factor analytic strategy that resulted in 11 primary trait scales assessing a range of distinct personality constructs, each in a relatively "pure" way (i.e., items of each scale correlate highly with one another and more weakly with items from other scales). Nevertheless, a reliable pattern of correlations is evident among the scales themselves, reflecting naturally occurring intersections among substantively distinct trait dispositions (Tellegen & Waller, in press). Reflecting these intercorrelations, factor analyses of the MPQ–BF primary scales (Patrick et al., 2002; Tellegen & Waller, in press) yielded three orthogonal higher order factors: Positive Emotionality (PEM), Negative Emotionality (NEM), and Constraint (CON). In an alternative four-factor solution, PEM parses into Agentic and Communal subfactors—reflecting dispositions to seek satisfaction through dominance and achievement versus affiliation, respectively. We used the more refined four-factor solution because prior work has provided evidence of divergent relations between these facets of PEM and indices of psychopathy and antisocial behavior (e.g., Krueger, Caspi, Moffitt, Silva, & McGee, 1996; Verona et al., 2001).

The primary scales that load most highly on Agentic-PEM are Well-Being, Social Potency, and Achievement. Thus, high scores on this dimension reflect the inclination to experience positive emotions through active engagement in one's environment (i.e., persuading and directing others, taking on challenges, and striving for success). The main markers of Communal-PEM are the primary trait scales of Well-Being and Social Closeness. High scorers on this dimension are individuals who seek pleasurable experience through relationships with others. The trait scales of Stress Reaction, Alienation, and Aggression load principally on NEM. Individuals scoring high on this dimension have a reduced threshold for experiencing negative emotions such as anger and anxiety, tend to break down easily under stress, experience the interpersonal world as hostile and unfair, and are willing to hurt others to get what they want.

The final MPQ–BF factor, CON, reflects a dimension of behavioral restraint-inhibition marked by the primary scales of Control, Harm Avoidance, and Traditionalism. Individuals high on CON tend to act cautiously, avoid thrills, and endorse conservative values, whereas individuals low on this dimensions tend to be impulsive, sensation seeking, and rebellious. An additional primary trait scale, Absorption, reflects differences in the proclivity for becoming lost in thought or entrancing stimuli. This scale does not load exclusively on any one of the higher order dimensions and has exhibited moderate overlap with the five-factor model dimension of Openness (Church, 1994). For the 11 primary scales, Cronbach's alpha ranged from .73 to .86 ($M = .79$) for the normative sample and from .61 to .82 ($M = .76$) for the total prisoner sample.

The MPQ–BF also includes two scales designed to detect invalid response patterns: (a) the True Response Inconsistency scale, which assesses inconsistencies in responding associated with a bias to answer items "true" or "false" irrespective of content, and (b) the Variable Response Inconsis-

tency scale, which assesses inconsistencies in responding not associated with either a "true" or a "false" response bias. The MPQ–BF includes norms for each of these inconsistency scales and normative cutoff criteria for classifying test protocols as invalid due to extreme scores on one or the other or both (see Patrick et al., 2002, for details). Applying these normative criteria, MPQ–BF profiles for 53 prisoners (9.8% of the overall assessment pool of 542 participants) had to be excluded due to invalid response patterns. Two other protocols were excluded because they were incomplete.

## *Data Analysis*

We employed model-based cluster analysis using the computer package MCLUST (Fraley, 1998) in the statistical language *R* (Ihaka & Gentleman, 1996) to classify psychopathic individuals into subtypes (i.e., the 96 prisoners with a PCL–R total $< 30$). Model-based cluster analysis represents a form of mixture modeling in which each observation is assumed to come from one of a number of multivariate normal subpopulations. The aim of model-based clustering is to estimate, using a fit criterion, the number of subpopulations, the assignment of each individual to a subpopulation, and the mean vector and covariance matrix of the 11 MPQ–BF primary scales for each subpopulation. In model-based clustering, different models with different assumptions about the structure of the data are fit, and a fit index is calculated for each model so that the best model can be selected on the basis of its goodness of fit.

In the present study, six mixture models were fit, each differing in terms of assumptions regarding the covariance matrices of each subpopulation. These assumptions specify three characteristics of the covariance matrices, which in turn specify three characteristics of the geometric shapes of the subpopulation distributions in multivariate space (see Fraley, 1998, for a more detailed discussion of the assumptions). The first of these characteristics specifies the *volume* of the distribution, which is proportional to the absolute magnitudes of the variances and covariances of the covariance matrix. The second characteristic specifies the *shape* of the distribution and is proportional to the relative magnitudes of the eigenvalues of the covariance matrix. The third characteristic specifies the *orientation*, which is specified by the eigenvectors of the covariance matrix.

The six alternative models thus varied in their assumptions regarding the volumes, shapes, and orientations of the subpopulation distributions in multivariate space. To facilitate understanding of the model-based clustering procedure, we illustrate the different assumptions by describing each model for the simplest case: a sample composed of two subpopulations (10 observations in each) that have been clustered on two variables. Models are ranked from most to least parsimonious, that is, Model 1 is the simplest model, and Model 6 is the most complex and so entails estimating the greatest number of parameters. For this example, the two clustering variables are the Stress Reaction and Aggression scales of the MPQ–BF. Figures 1A–1F are graphical depictions of each model for this example, with axes of the two personality dimensions intersecting at the mean for the total sample. The cluster in the upper right quadrant of each panel represents high scores on Aggression and somewhat elevated scores on Stress Reaction. The cluster in the lower left quadrant of each panel represents low scores on Stress Reaction and slightly below-the-norm scores on Aggression.

Model 1 assumes that the two clusters are spherical in shape and of equal volume. The spherical shape means that *within each cluster*, the covariance between the two traits is so low it can be fixed to zero, resulting in a diagonal matrix. Equal volume means that the within-cluster variability is the same for each cluster, and so the clusters identify equally homogeneous subpopulations.

Model 2 also assumes the clusters are spherical in shape but allows the volume to differ. Therefore, one cluster will have greater with-in cluster variability, the implication being that one cluster is a more heterogeneous group of persons than the other.

Model 3 assumes the clusters are of equal volume and the same shape but does not require that the clusters be spherical, which allows for the estimation of an orientation parameter. The orientation parameter is a function of the covariance between the traits within each cluster. Model 3 assumes the clusters have the same orientation. Therefore, for persons in both clusters, as an individual's level of Stress Reaction increases, so does their level of Aggression.

Model 4 assumes the shape and volume are the same across clusters but allows the orientation to differ. Therefore, for members of the subpopulation whose scores are represented in the upper right quadrant, as an individual's level of Stress Reaction decreases, their level of Aggression increases. The reverse is the case for members of the other subpopulation.

Model 5 assumes the clusters have the same shape but allows the orientation and volume to differ. Therefore, not only is the relationship between the traits different for each subpopulation but also one cluster is a more heterogeneous group than the other (i.e., greater within-cluster variability).

Model 6, or the unconstrained model, allows all three parameters to vary across the clusters. Therefore, the clusters can differ in terms of within group heterogeneity (volume) and the relationship between the trait dimensions may differ across clusters (shape and orientation).

The default setting for the MCLUST program is to fit each of these six types of models under the assumption of one to nine different subpopulations. Thus, a total of 54 different models were tested, using the 11 MPQ–BF primary scales as variables in the cluster analysis (rather than the two traits used in the preceding examples). Psychopaths with similar personality structure (i.e., who had a similar profile across the 11 MPQ–BF primary scales) were thus assigned to the same cluster; the mean MPQ–BF primary scale profile, as well as the MPQ–BF primary scale covariance matrix, was estimated for each cluster.

The Bayesian Information Criterion (BIC), an approximation to the Bayes factor, was used to evaluate the fit of each model. BIC was designed to balance fit with parsimony such that it selects models that maximize fit while minimizing the number of parameters. A major advantage in using BIC is that more than one model can be compared simultaneously without the restriction that the models be nested. Better-fitting models will have less negative values,[1] and the difference in BIC relates to the posterior odds—the odds ratio formed by taking the probability that the second model is correct, given the data, over the probability that the first model is correct, given the data. When comparing models, a difference in BIC of 10 corresponds to the odds being 150:1 that the model with the less negative BIC value is the better-fitting model and is considered very strong evidence in favor of the model with the greater BIC value (Raftery, 1995).

Once the best-fitting model has been identified using this approach, the confidence of cluster assignment for each individual can be estimated by calculating the posterior probability associated with that individual being a member of each cluster. For example, for a model involving two clusters, A and B, the posterior probability of being in cluster A, $P(\mathrm{A})$, can be calculated, along with the symmetric posterior probability of being in cluster B, $P(\mathrm{B}) = 1 - P(\mathrm{A})$. For instance, an individual with a .90 posterior probability of being in Cluster A would have a .10 posterior probability of being in Cluster B.

Following the identification of psychopathy subgroups using model-based cluster analysis, follow-up analyses were performed for descriptive purposes. A multivariate analysis of variance (MANOVA) was first performed to compare the subtypes with one another and with control prisoners on the trait and factor scales of the MPQ–BF. Statistically reliable

[1] Other authors have defined BIC to have the opposite sign, that is, more negative values indicate better fit. Banfield and Raftery (1993), however, chose to reverse the sign of BIC to ease the interpretation of the plots of BIC across alternative models. We have decided to remain consistent with their convention.

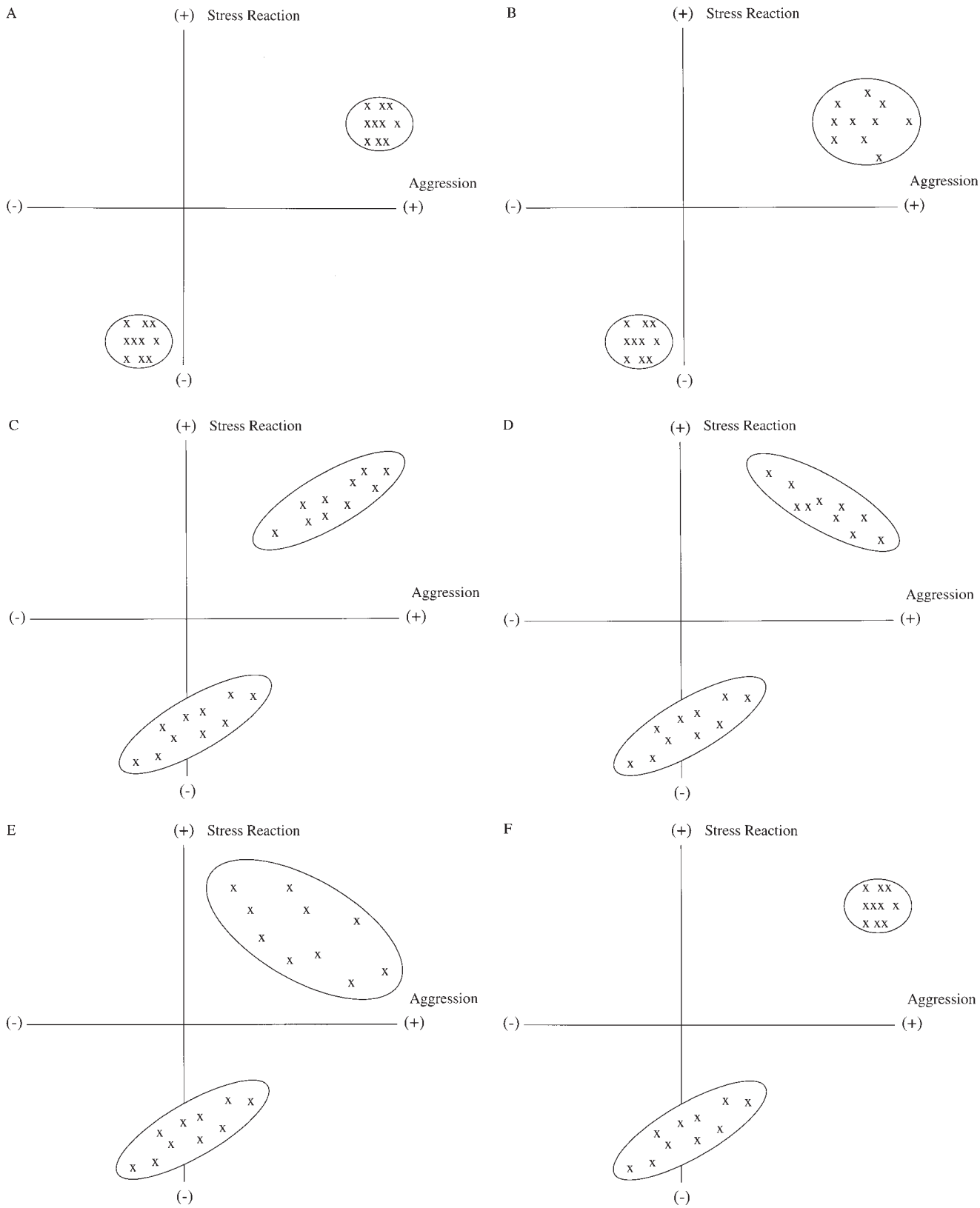


*Figure 1.* Each panel depicts the different assumptions of the models for a hypothetical example of the simplest possible scenario: A data set with two subpopulations clustered on two variables, in this case the Stress Reaction and Aggression scales of the MPQ–BF. The two personality dimensions intersect at the average for the combined sample, such that a minus sign indicates a score below the total sample mean and plus sign indicates a score above the total sample mean. A: Model 1 (spherical shape, equal volume). B: Model 2 (spherical shape, unequal volume). C: Model 3 (equal shape, volume, and orientation). D: Model 4 (equal shape and volume, different orientation). E: Model 5 (equal shape, different volume and orientation). F: Model 6 (different shape, volume, and orientation).

omnibus effects were followed by post hoc comparisons using Tukey's procedure.

### External Validation Criteria

We also examined the discriminant and convergent validity of the personality-based cluster groups via comparisons on external criterion measures. Data were available for varying numbers of prisoners classified as psychopathic on variables that tend to exhibit a differential association with the two facets of psychopathy. These variables included self-reported fights as a child and adult; age of first criminal charge; the Short Michigan Alcohol Screening Test (SMAST; Selzer, Vinokur, & van Rooijen, 1975); and the Shipley Institute of Living Scale, a brief measure of intellectual functioning, which includes Vocabulary and Abstract Reasoning subtests and yields an estimate of full scale IQ (Zachary, 1986). We also compared the clusters on the Socialization scale of the California Psychological Inventory (CPI; Gough, 1957) and the WAS, because these measures have been used to subdivide high PCL scorers in previous research (Hare, Frazelle, & Cox, 1978; Newman, 1998). We anticipated that (a) one subtype would exhibit an earlier age of first criminal charge, report more fights as a child and adult, and have more problems associated substance use (scores on the SMAST), and (b) the other subtype would score higher on measures of intellectual functioning (Shipley scales) and socialization (CPI Socialization) and lower on subjective anxiety (WAS).

## Results

### Model Fitting

The results of the model-based cluster analysis are presented in Table 1. From inspection of the results, several conclusions can be drawn. First, the dataset contains more than one cluster because none of the models corresponding to the hypothesis that the sample is composed of a single cluster (equivalent to the null hypothesis) is the best-fitting model. Second, the two best-fitting models each contain two clusters. Finally, the two best-fitting models both assume that the clusters are spherical; for one model the clusters are of equal volume (BIC = −5302.61), for the other model the volume of the clusters is allowed to vary (BIC = −5305.40). The two models result in an identical classification of the sample members; therefore, we simply chose the model with the greater BIC value and more parsimonious structure, that is, Model 1: two spherical clusters of equal volume. All remaining models exhibited a substantial decline in fit (BIC $<$ −5,322.63).

After the best-fitting model was identified, we calculated for each individual the posterior probability associated with that individual being a member of each cluster in the model. Because the best-fitting model contained two clusters, each individual had a posterior probability of being in one cluster, $P(A)$, and a symmetric posterior probability of being in the other cluster, $1 - P(A)$. Table 2 provides a summary of how well the model was able to classify members of the sample. Two thirds of the sample fit the model very well and had a high probability ($>$ .95) associated with being a member of one cluster (and thus a probability .05 of being a member of the other cluster). The model did not fit well for some individuals ($n = 12$, or 12.5% of the psychopath sample) who had a relatively low probability ($<$ .80) associated with being in either cluster. Individuals who had low probabilities associated with being in either cluster tended to exhibit certain features characteristic of each cluster, making it difficult to assign them to one cluster and not the other.

Demographically, the first psychopathy cluster ($n = 30$) was composed of 40.0% ($n = 12$) African Americans, 56.7% ($n = 17$) Caucasians, and 3.3% ($n = 1$) Hispanics, and had a mean age of 34.7 years ($SD = 7.2$ years, range = 19–55 years). The second psychopathy cluster ($n = 66$) was composed of 50.0% ($n = 33$) African Americans, 47.0% ($n = 31$) Caucasians, and 3.0% ($n = 2$) Hispanics and had a mean age of 29.4 years ($SD = 5.9$ years, range = 18.0–40.0 years). The clusters did not differ significantly in terms of racial composition, $\chi^2(2, N = 96) = 0.83$, $p = .66$, $\Phi = .09$, but the average age of psychopaths in the first cluster was higher than that of psychopaths in the second cluster, $t(94) = 3.52$, $p < .01$, $d = 0.81$. The clusters did not differ on PCL–R total or Factor 1 scores but did differ on Factor 2, $t(94) = 2.34$, $p = .02$, $d = 0.52$, with psychopaths in the second cluster scoring slightly higher than those in the first cluster.

### Personality Differences

Figure 2 provides a graphic depiction of mean T scores for the two psychopathy clusters and the control prisoners on the primary scales and higher order factors of the MPQ–BF, each scaled to the normative sample (i.e., for each MPQ–BF variable, $M = 50$ and $SD = 10$ for participants in the normative sample). For psychopaths in the first cluster, the most extreme score was on the Stress Reaction scale (in a negative direction), so we refer to these as *emotionally stable* psychopaths. Psychopaths in the second cluster exhibited their highest score on the Aggression scale, so we refer to these as *aggressive* psychopaths.

Table 3 lists MPQ–BF score means and standard deviations for the two psychopathy clusters and control prisoners. For descriptive purposes, the standardized difference from the mean of the normative sample is also provided, which can be interpreted as the effect size (Cohen, 1988). For all prisoner groups, an effect size greater than ±.37 is equivalent to a significant difference from the normative sample at $\alpha = .05$, two-tailed (Cohen, 1988); values exceeding this criterion are identified in bold. Control prisoners were very similar to the normative sample, with scores elevated on Alienation only. Relative to the normative sample, emotionally stable psychopaths scored high on Social Potency and Achievement as well as Alienation and scored low on Stress Reaction, Social Closeness, and Harm Avoidance. Emotionally stable psychopaths also scored above the norm on the higher order MPQ–BF factor of Agentic-PEM. Aggressive psychopaths scored higher than the normative sample on Social Potency, Stress Reaction, Alienation, and Aggression and scored lower on Well-Being, Social Closeness, Control, Harm Avoidance, and Traditionalism. Aggressive psychopaths also scored higher on the broad NEM dimension of the MPQ–BF and low on the CON and Communal-PEM dimensions.[2]

[2] It is notable that in terms of MPQ–BF trait indicators, these psychopathy subtypes closely parallel the factors of the Psychopathic Personality Inventory (PPI; Lilienfled & Andrews, 1996), a well-validated self-report measure that was designed to comprehensively index the construct of psychopathy. A recent structural analysis of the PPI subscales in a large sample of community men revealed two uncorrelated factors labeled *PPI-I Fearless Dominance* and *PPI-II Impulsive Antisociality* that mirrored the two factors of the PCL–R in terms of relations with demographic, personality, and behavioral measures

Table 1
*Bayesian Information Criterion (BIC) Values for Alternative Models*

| | Cluster characteristic | | | Number of clusters | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model | Shape | Volume | Orientation | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 1 | Spherical | Equal | — | −5,323 | **−5,303** | −5,331 | −5,345 | −5,342 | −5,360 | −5,386 | −5,407 | −5,436 |
| 2 | Spherical | Varying | — | −5,323 | **−5,305** | −5,332 | −5,353 | −5,364 | −5,387 | −5,400 | −5,439 | −5,469 |
| 3 | Equal | Equal | Equal | −5,373 | −5,411 | −5,393 | −5,440 | −5,491 | −5,505 | −5,535 | −5,538 | −5,609 |
| 4 | Equal | Equal | Varying | −5,373 | −5,559 | −5,762 | −5,958 | −6,106 | −6,296 | −6,456 | −6,476 | −6,492 |
| 5 | Equal | Varying | Varying | −5,373 | −5,562 | −5,756 | −5,967 | −6,119 | −6,276 | −6,414 | −6,477 | −6,454 |
| 6 | Varying | Varying | Varying | −5,373 | −5,581 | −5,668 | — | — | — | — | — | — |

*Note.* Values represent BIC values; greater values indicate better fit. The two best-fitting models are in bold. BIC values have been rounded to the nearest whole number. Models are ordered from most to least parsimonious. 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 1 and 2 indicate that because there are no off-diagonal elements, an orientation parameter cannot be estimated. The dashes in the row for Model 6 indicate that the sample was too small to estimate the fit of Model 6 (unconstrained model) beyond three clusters.

A three-group MANOVA comparing the control prisoners and psychopath cluster groups on the 11 primary trait scales of the MPQ–BF yielded an overall omnibus difference, $F(22, 416) = 7.88$, $p < .001$, Wilks's $\lambda = .498$. A second MANOVA comparing the three prisoner groups on the four higher order factors of the MPQ–BF also yielded a significant overall difference, $F(8, 430) = 15.19$, $p < .001$, Wilks's $\lambda = .608$.

We used Tukey's post hoc tests to compare the psychopathy subtypes with one another and with control prisoners on each of the MPQ–BF primary scales and factors. Emotionally stable psychopaths scored significantly lower than control prisoners on Stress Reaction and NEM and scored higher on Agentic-PEM. Aggressive psychopaths scored significantly higher than control prisoners on Social Potency, Stress Reaction, Alienation, Aggression and on the higher order NEM factor, and they scored significantly lower than control prisoners on Well-Being, Achievement, Social Closeness, Control, Harm Avoidance, Traditionalism and the higher order factors of CON and Communal-PEM.

For descriptive purposes, we also compared the two psychopathic clusters with one another in terms of their MPQ–BF scores. The aggressive subtype scored higher than the emotionally stable subtype on the primary trait scales of Stress Reaction, Alienation, and Aggression and scored lower on Well-Being, Achievement, and Control. The groups also differed on the higher order factors, with aggressive psychopaths scoring higher on NEM and lower on CON and Agentic-PEM than emotionally stable psychopaths.

### *External Validation Criteria*

We also compared the two psychopathy subtypes on several external measures that have shown differential associations with the two facets of psychopathy in prior research. The variables and results of these comparisons are provided in Table 4. Consistent with the moniker, aggressive psychopaths reported engaging in a significantly greater number of fights both as a child and adult. Aggressive psychopaths also had a slightly earlier age of first criminal charge. Additionally, aggressive psychopaths endorsed more problems associated with alcohol use, although this comparison only approached significance. Emotionally stable psychopaths scored significantly higher in estimated IQ, and this difference was due to their superior performance on the Vocabulary subtest. Consistent with previous experimental work that has subdivided high scorers on the PCL, the subtypes also differed on the Socialization scale and especially on the WAS, with emotionally stable psychopaths scoring higher on the Socialization scale and, consistent with the term *stable*, lower on the WAS.

(Benning, Patrick, Hicks, Blonigen, & Krueger, 2003). In the Benning et al. (2003) study, scores on each of the PPI factors were strongly predicted (multiple $R$s = .7) by selected subscales of the MPQ–BF: PPI-I Fearless Dominance was marked by low Stress Reaction, high Social Potency, and low Harm Avoidance; PPI-II Impulsive Antisociality was marked by high Aggression and Alienation, and low Control, Traditionalism, and Social Closeness. The implication is that the two psychopathy subtypes in our study reflect extremes of the two facets of psychopathy indexed by the PPI, which in turn can be viewed as self-report indices of the constructs underlying the two factors of the PCL–R (Benning, Patrick, Blonigen, Hicks, & Iacono, 2003). To follow up on this observation, we compared the two psychopathy subtypes on PPI factor scores estimated on the basis of participants' MPQ–BF primary scale scores, using regression equations derived from the data of Benning, Patrick, Hicks, et al. (2003). The two psychopathy subtypes differed markedly in terms of estimated scores on the two PPI factors: Emotionally stable psychopaths scored higher on PPI-I Fearless Dominance, whereas aggressive psychopaths scored higher on PPI-II Impulsive Antisociality, $t$s(94) = 4.20 and 8.20, respectively, $p$s < .001. Consistent with the results of the PCL–R factor comparisons, there was a greater difference between the subtypes on PPI-II Impulsive Antisociality ($d = 1.73$) than on PPI-I Fearless Dominance ($d = 0.88$). Also notable is that, although by definition, both psychopath subtypes scored high on both factors of the PCL–R, emotionally stable psychopaths differed from control prisoners only on PPI-I Fearless Dominance, $t(153) = 3.66$, $p < .001$, $d = 0.73$, with no difference on PPI-II Impulsive Antisociality, $t(153) = 0.46$, $p = .65$, whereas aggressive psychopaths differed from control prisoners on PPI-II Impulsive Antisociality, $t(189) = 9.36$, $p < .001$, $d = 1.09$, but not PPI-I Fearless Dominance, $t(189) = 0.79$, $p = .43$. These results indicate that the two subtypes of psychopaths identified by our model-based cluster analysis represent extremes of the two facets of psychopathy indexed by the PPI.

Table 2
*Confidence of Cluster Assignment for the Best-Fitting Model*

| Probability of being in a specific cluster | Cluster 1 ($n$ = 30) | Cluster 2 ($n$ = 66) | Total with psychopathy ($n$ = 96) |
|---|---|---|---|
| ≥.95 | 19 (63.3%) | 46 (69.7%) | 65 (67.7%) |
| ≥.90 | 3 (10.0%) | 9 (13.6%) | 12 (12.5%) |
| ≥.80 | 2 (6.7%) | 5 (7.6%) | 7 (7.3%) |
| <.80 | 6 (20.0%) | 6 (9.1%) | 12 (12.5%) |

## Discussion

The goal of this study was to identify subtypes of psychopaths on the basis of differences in personality structure. Toward this end, we used model-based cluster analysis to test for the presence of subtypes within a sample of psychopathic male criminal offenders diagnosed using the PCL–R. Scores on the primary trait scales of the brief form of the MPQ–BF, an omnibus measure of personality, were used as the basis for classification. Using the BIC as the index of fit, we identified a best-fitting model containing two clusters.

Psychopaths in the first cluster were characterized by low scores on Stress Reaction and high scores on Agentic-PEM, and resembled conceptions of the primary psychopath (e.g., Karpman, 1941; Lykken, 1957, 1995). The low score on Stress Reaction was the most distinctive characteristic of this subgroup, prompting us to label them emotionally stable psychopaths. Contrary to many conceptions of psychopathy, emotionally stable psychopaths were not characterized by high trait impulsivity. If anything, emotionally stable psychopaths tended to describe themselves as planful and less likely to act without forethought ($d$ = 0.35 for Control), but they also scored low on Harm Avoidance, reflecting tendencies toward sensation seeking and fearlessness. Although this is a complex configuration, the characterization of an individual as immune to negative events (low Stress Reaction), socially dominant (high Agentic-PEM) but lacking in close attachments (low Social Closeness), capable of strategic action (elevated Control) but prone to take risks (low Harm Avoidance), is an apt description of what many have termed the "classic" psychopath. It is interesting that the personality elevations of the emotionally stable psychopath were less extreme than for the other subtype, as described below. The elevations on select, theoretically important trait constructs recalls Cleckley's (1941/1988) description of a "mask of sanity," that is, extreme behavioral deviance (as evidenced by their uniformly high PCL–R scores) in the presence of a superficially normal social presentation.

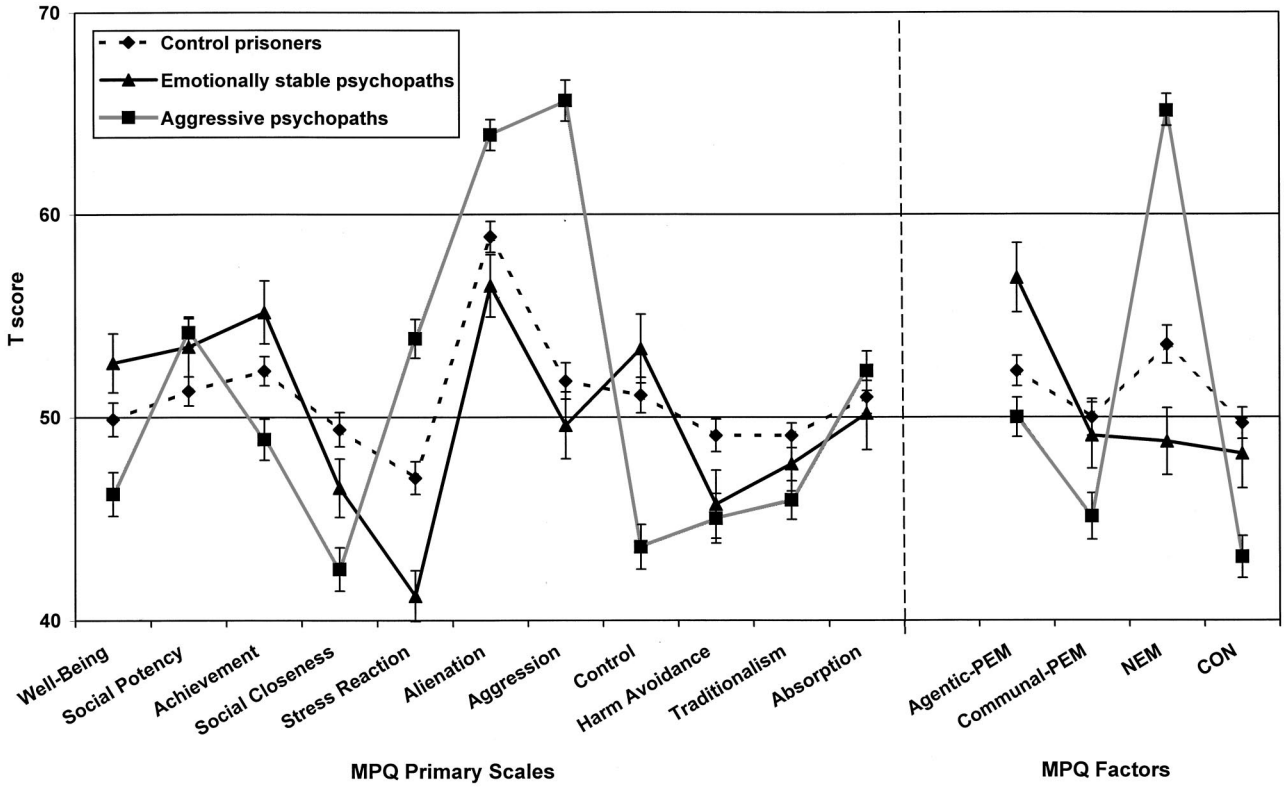


*Figure 2.* Personality profiles for psychopathic subtypes and control prisoners referenced to the normative sample. The normative sample ($n$ = 1,350) is scaled to have a mean of 50 and a standard deviation of 10. Emotionally stable psychopaths = participants in first psychopathy cluster group ($n$ = 30). Aggressive psychopaths = participants in second psychopathy cluster group ($n$ = 66). Control prisoners = participants with low scores on the PCL–R overall, and on each of its factors. MPQ–BF = Multidimensional Personality Questionnaire—Brief Form; PEM = Positive Emotionality; NEM = Negative Emotionality; CON = Constraint.

Table 3
*Personality Differences Between Psychopathy Subtypes and Control Prisoners*

| MPQ–BF scale | Control ($n$ = 125) | Psychopathy subtypes: Stable ($n$ = 30) | Psychopathy subtypes: Aggressive ($n$ = 66) | $p$ values for Tukey's post hoc comparisons: Stable vs. aggressive | $p$ values for Tukey's post hoc comparisons: Stable vs. control | $p$ values for Tukey's post hoc comparisons: Aggressive vs. control |
|---|---|---|---|---|---|---|
| Primary scale | | | | | | |
| Well-Being | | | | | | |
| *M* | 49.9 | 52.7 | 46.2 | .004 | | .030 |
| *SD* | 9.3 | 8.0 | 8.8 | | | |
| *d* | −0.01 | 0.30 | **−0.40** | | | |
| Social Potency | | | | | | |
| *M* | 51.3 | 53.5 | 54.2 | | | .032 |
| *SD* | 8.0 | 8.1 | 5.7 | | | |
| *d* | 0.14 | **0.38** | **0.52** | | | |
| Achievement | | | | | | |
| *M* | 52.3 | 55.2 | 48.9 | .002 | | .021 |
| *SD* | 8.1 | 8.5 | 8.3 | | | |
| *d* | 0.25 | **0.56** | −0.12 | | | |
| Social Closeness | | | | | | |
| *M* | 49.4 | 46.5 | 42.5 | < .001 | | < .001 |
| *SD* | 9.5 | 7.9 | 8.6 | | | |
| *d* | −0.06 | **−0.39** | **−0.80** | | | |
| Stress Reaction | | | | | | |
| *M* | 47.0 | 41.2 | 53.9 | < .001 | .002 | < .001 |
| *SD* | 9.1 | 6.8 | 7.8 | | | |
| *d* | −0.31 | **−1.03** | **0.43** | | | |
| Alienation | | | | | | |
| *M* | 58.9 | 56.5 | 63.9 | < .001 | | < .001 |
| *SD* | 8.5 | 8.4 | 6.2 | | | |
| *d* | **0.96** | **0.70** | **1.67** | | | |
| Aggression | | | | | | |
| *M* | 51.8 | 49.6 | 65.6 | < .001 | | < .001 |
| *SD* | 10.1 | 9.1 | 8.3 | | | |
| *d* | 0.18 | −0.04 | **1.70** | | | |
| Control | | | | | | |
| *M* | 51.1 | 53.4 | 43.6 | < .001 | | < .001 |
| *SD* | 9.8 | 9.3 | 8.9 | | | |
| *d* | 0.11 | 0.35 | **−0.68** | | | |
| Harm Avoidance | | | | | | |
| *M* | 49.1 | 45.7 | 45.0 | | | .013 |
| *SD* | 9.1 | 9.2 | 9.9 | | | |
| *d* | −0.09 | **−0.45** | **−0.50** | | | |
| Traditionalism | | | | | | |
| *M* | 49.1 | 47.7 | 45.9 | | | .009 |
| *SD* | 6.8 | 7.4 | 7.7 | | | |
| *d* | −0.11 | −0.26 | **−0.46** | | | |
| Absorption | | | | | | |
| *M* | 51.0 | 50.2 | 52.3 | | | |
| *SD* | 9.2 | 9.9 | 8.0 | | | |
| *d* | 0.10 | 0.02 | 0.25 | | | |
| Higher order scale | | | | | | |
| Agentic-PEM | | | | | | |
| *M* | 52.3 | 56.9 | 50.0 | .001 | .030 | |
| *SD* | 8.4 | 9.3 | 8.0 | | | |
| *d* | 0.25 | **0.71** | 0.00 | | | |
| Communal-PEM | | | | | | |
| *M* | 50.0 | 49.1 | 45.1 | | | .002 |
| *SD* | 10.2 | 9.0 | 9.3 | | | |
| *d* | 0.00 | −0.09 | **−0.51** | | | |
| NEM | | | | | | |
| *M* | 53.6 | 48.8 | 65.1 | < .001 | .024 | < .001 |
| *SD* | 10.5 | 9.1 | 6.2 | | | |
| *d* | 0.35 | −0.13 | **1.81** | | | |
| Constraint | | | | | | |
| *M* | 49.7 | 48.2 | 43.1 | .018 | | < .001 |
| *SD* | 8.7 | 9.4 | 8.4 | | | |
| *d* | −0.03 | −0.19 | **−0.75** | | | |

*Note.* MPQ–BF = Multidimensional Personality Questionnaire—Brief Form; PEM = Postive Emotionality; NEM = Negative 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; can be interpreted as the effect size. The *d*s greater than 0.37 are in bold; this is the effect size that must be present in the sample with stable psychopathy to detect a difference from the normative sample at $\alpha$ = .05, two-tailed (Cohen, 1988). For the post hoc tests, only protected $p$ values <.05 are reported.

Table 4
*Comparisons Between Psychopathy Subtypes on External Validation Criteria*

| Variable | Emotionally stable | | Aggressive | | | | |
|---|---|---|---|---|---|---|---|
| | *M* (*SD*) | *N* | *M* (*SD*) | *N* | *t* | *df* | *p* |
| No. of childhood fights | 1.0 (2.2) | 14 | 4.4 (5.2) | 22 | 2.7 | 34 | .01 |
| No. of adult fights | 14.4 (25.8) | 30 | 31.3 (37.9) | 63 | 2.5 | 91 | .01 |
| Age of first charge | 17.8 (6.7) | 30 | 15.6 (4.1) | 65 | 2.1 | 93 | .04 |
| SMAST | 7.1 (8.7) | 30 | 10.4 (8.6) | 66 | 1.8 | 94 | .08 |
| Estimated IQ | 95.4 (10.2) | 24 | 89.8 (11.4) | 54 | 2.1 | 76 | .04 |
| Vocabulary | 27.6 (5.9) | 24 | 24.6 (5.6) | 54 | 2.1 | 76 | .04 |
| Abstract Reasoning | 25.3 (7.0) | 24 | 22.6 (7.7) | 54 | 1.4 | 76 | .16 |
| Socialization | 29.4 (5.2) | 14 | 24.8 (5.5) | 22 | 2.5 | 34 | .02 |
| Welsh Anxiety Scale | 7.4 (6.9) | 16 | 17.2 (8.2) | 43 | 4.2 | 57 | $< .001$ |

*Note.* SMAST = Short Michigan Alcohol Screening Test; Estimated IQ refers to Wechsler Adult Intelligence Scale—Revised (Wechsler, 1981) total score, as estimated using the Shipley Institute of Living Vocabulary and Abstract Reasoning subscale scores.

The personality differences between psychopaths in the second cluster and nonpsychopathic control prisoners were more dramatic and of greater magnitude than for the stable psychopaths. Psychopaths in this cluster differed not only from the normative sample but also from control prisoners on 10 of the 11 primary scales and three of the four higher order factors. In particular, psychopaths in this group scored very high on NEM and low on CON and Communal-PEM. The most distinctive feature of individuals in this group was their high score on Aggression, prompting us to label them aggressive psychopaths. Unlike stable psychopaths, who might appear well adjusted in many contexts (e.g., occupations requiring independence, authority, and the ability to cope with stressful circumstances), the personality profile of aggressive psychopaths seems to epitomize psychological maladjustment of the undercontrolled or externalizing variety (Krueger et al., 2002). The profile of this psychopath group reflects tendencies to be upset by minor irritants (high Stress Reaction), to respond readily with aggressive action (high Aggression), to view the world as populated by potential enemies (high Alienation), to be disinhibited and uncontrolled (low CON), and to be lacking in close relationships (low Communal-PEM).

Comparisons between the clusters on available external measures provided an encouraging initial step in the validation of the subtypes. Consistent with our nomenclature, aggressive psychopaths reported engaging in more fights both in childhood and in adulthood, although it may not be surprising that the persons who endorsed more aggressive traits on a personality questionnaire also reported more aggressive behavior. Aggressive psychopaths also exhibited an earlier age of onset of criminal behavior and a lower IQ, the latter being attributable to their poorer performance on the Vocabulary subtest. These comparisons are particularly notable as they are consistent with Moffitt's (1993) conceptualization of the life-course persistent offender, that is, an early onset of antisocial behavior and deficits in neuropsychological ability likely to be evidenced by low verbal IQ. Further, longitudinal research has shown that boys who exhibit persistent antisocial behavior from childhood through adolescence have a personality structure at age 18 that closely resembles the aggressive psychopath of the current investigation (Moffitt, Caspi, Dickson, Silva, & Stanton, 1996). Although speculative and in need of follow-up study, these findings suggest that the aggressive psychopath is the adult manifestation of the life-course persistent offender (Moffitt, 1993).

Aggressive psychopaths also reported more problems related to alcohol use, but this difference failed to reach statistical significance. However, given that the personality pattern of low CON and high NEM has consistently been associated with substance dependence disorders (Krueger et al., 1996; McGue, Slutske, & Iacono, 1999; McGue, Slutske, Taylor, & Iacono, 1997), there is reason to predict aggressive psychopaths will exhibit a greater number of substance-use-related problems. Future studies that assess more severe substance pathology such as psychiatric criteria for alcohol and drug dependence may be more likely to detect differences between the subtypes.

Particularly encouraging to the validity of the psychopathy subtypes were the group differences on the Socialization scale and WAS, as other investigators have detected group differences in performance on experimental tasks between high PCL scorers subdivided on these measures. The subtype differences on the WAS provide a link to a notable body of experimental research on high- and low-anxious psychopaths defined in terms of scores on the WAS (for a review, see Newman, 1998). It seems likely that the emotionally stable and aggressive subtypes roughly correspond to the low- and high-WAS psychopaths, respectively. Because a substantial body of literature exists on performance and reactivity differences between low- and high-WAS psychopaths (e.g., Arnett, Smith, & Newman, 1997; Newman, Kosson, & Patterson, 1992; Newman & Schmitt, 1998; Newman et al., 1997), the link between these two lines of research suggests important convergent evidence for the existence of psychopathy subtypes as well as highlighting potentially productive paradigms for examining MPQ–BF subgroup differences.

Although this study was well-equipped to investigate the existence of subtypes, certain limitations must be borne in mind. One is that our sample included only male prisoners. Of interest for future research will be to investigate whether the psychopathy subtypes identified here also emerge in other populations such as female prisoners, children, and adolescents exhibiting severe behavioral problems or individuals from the community rated high on psychopathy.

Although the subtype differences on the WAS and Socialization scale provide evidence of discriminant validity, a more convincing demonstration would be provided by evidence of differences in reactivity or performance on laboratory tasks that have yielded reliable differences between psychopaths and nonpsychopaths in past research, such as stressor anticipation (cf. Hare, 1978), passive avoidance learning (Lykken, 1957; Schmauk, 1970), reward–punishment learning (Newman, 1987; Newman et al., 1987), emotion-modulated startle (Levenston, Patrick, Bradley, & Lang, 2000; Patrick, Bradley, & Lang, 1993), divided attention (Kosson, 1996, 1998), and associative interference paradigms (Newman et al., 1997). Of perhaps even greater interest is whether the existence of subtypes might help to account for unreliable or contradictory findings in the psychopathy literature—for example, mixed findings concerning the relation between psychopathy and frontal lobe function (cf. Morgan & Lilienfeld, 2000) or between psychopathy and event-related brain potential (P300) response (cf. Raine, 1989). Specifically, we anticipate the aggressive subtype will exhibit deficits in neuropsychological function and event-related brain potential response, whereas the emotionally stable subtype will exhibit a relatively normative pattern of function and response.

In the realm of criminal behavior, differences between psychopathy subtypes might also be expected in terms of frequency, nature, and intensity of offenses committed. For example, impulsive violent acts would be expected to occur more frequently among aggressive psychopaths, whereas acts of fraud and instrumental violence would likely be more characteristic of stable psychopaths. Also important for future research will be whether our subtype classification has clinical utility such as in the development of more efficacious intervention strategies and in predicting outcomes of the utmost import such as criminal recidivism, violence, and suicidality.

## Interpretations and Implications

Our approach in the current study was to characterize personality from a configural perspective. We focused on the way in which variations along multiple trait dimensions as indexed by the scales of the MPQ–BF cohered across participants to yield groupings of prisoners with similar personality structures. Our aim in taking this approach was not to test a dimensional versus categorical model of psychopathy but rather to identify meaningful subgroups within a putatively homogeneous population (i.e., psychopaths as diagnosed by the PCL–R), using independent criterion variables. Our interpretation is that these subtypes represent the confluence of basic dimensions of personality.

An unresolved issue in the foregoing discussion is why individuals with such markedly different personality structures exhibit ostensibly the same severe pathology. Given the extensive evidence that personality is a risk factor for psychopathology and criminality across the life span (Caspi, 2000; Caspi, Moffitt, Newman, & Silva, 1996; Cloninger, Sigvardsson, & Bohman, 1988; Krueger, 1999) and the theoretical perspective that personality represents psychobiological structure (Tellegen, 1991), distinct personality subtypes may well reflect different etiologies. In this regard, Patrick and Lang (1999; see also Patrick, in press) postulated the existence of two distinct pathways to psychopathy that might account for the subtypes identified here—one involving a heightened threshold for defensive reactivity, evidenced by a reduction or absence of fear-potentiated startle under conditions of threat, and another involving deficits in higher cognitive ("executive") functioning that impair emotional processing and decision making under conditions of complexity or high task demand. This is one example of a framework that could be used to explain the existence of psychopathy subgroups. Alternative multiple pathway models have been proposed to account for disinhibited behavior (e.g., Fowles & Kochanska, 2000; Newman & Wallace, 1993).

In conclusion, we have attempted to frame our findings within the context of structural models of personality and psychopathology. Besides offering a rich perspective within which to investigate complex clinical phenomena like psychopathy, we see this as a valuable framework for integrating findings from different subdomains of psychopathology and different methodological traditions. In this regard, we hope that the current work will serve as a bridge between the experimental literature on psychopathy and the personality, criminology, and general psychopathology literatures and that we have successfully highlighted productive paths for continuing research.

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