Two Subtypes of Psychopathic Violent Offenders That Parallel Primary and Secondary Variants

Jennifer Skeem
University of California, Irvine

Peter Johansson and Henrik Andershed
Swedish Prison and Probation Service and Örebro University

Margaret Kerr
Örebro University

Jennifer Eno Louden
University of California, Irvine

Although psychopathy usually is treated as a unitary construct, a seminal theory posits that there are 2 variants: Primary psychopathy is underpinned by an inherited affective deficit, whereas secondary psychopathy reflects an acquired affective disturbance. The authors investigated whether psychopathy phenotypically may be disaggregated into such types in a sample of 367 prison inmates convicted of violent crimes. Model-based cluster analysis of the Revised Psychopathy Checklist (PCL–R; R. D. Hare, 2003) and trait anxiety scores in the psychopathic subgroup ($n = 123$; PCL–R ≥ 29) revealed 2 clusters. Relative to primary psychopaths, secondary psychopaths had greater trait anxiety, fewer psychopathic traits, and comparable levels of antisocial behavior. Across validation variables, secondary psychopaths manifested more borderline personality features, poorer interpersonal functioning (e.g., irritability, withdrawal, poor assertiveness), and more symptoms of major mental disorder than primary psychopaths. When compared with the nonpsychopathic subgroup ($n = 243$), the 2 psychopathic variants manifested a theoretically coherent pattern of differences. Implications for etiological research and violence prevention are discussed.

Keywords: psychopathy, subtypes, primary psychopathy, secondary psychopathy

Few personality disorders are considered more malignant than psychopathy. Although there is no consensus on its exact contours, classic conceptions of psychopathy highlight fundamental incapacities to feel such higher human emotions as empathy, anxiety, or guilt (Cleckley, 1941; Karpman, 1941) and to form loving attachments with others (McCord & McCord, 1964). Undeterred by ordinary pangs of conscience, individuals with psychopathy dominate, manipulate, and exploit others: They seek stimulation and satisfaction of their own personal needs, with little concern about the consequences (Poythress, Edens, Lilienfeld, & Skeem, 2001). Psychopathy is viewed as a rare, severe form of antisocial person-ality disorder. Although most criminal offenders have histories of impulsive, socially deviant behavior that qualify them for antisocial personality disorder diagnoses (approximately 80%), relatively few (approximately 15%–20%; Hart & Hare, 1997) have the additional traits of emotional detachment required for a diagnosis of psychopathy according to the most widely accepted psychopathy measure, the Revised Psychopathy Checklist (PCL–R; Hare, 2003).

Although psychopathy usually is treated as a unitary construct captured by a total PCL–R score, converging evidence from a growing body of theory and research suggests that there are variants of psychopathy (for a review, see Skeem, Poythress, Edens, Lilienfeld, & Cale, 2003). Perhaps the first suggestion that there are variants of psychopathy appeared in Karpman's (1941, 1948) classic distinction between primary and secondary psychopathy. This distinction has been developed and extended by more recent theorists (Blackburn, 1975; Lykken, 1995; Mealey, 1995; Porter, 1996). In Karpman's (1941, 1948) view, the two variants are phenotypically similar, but primary psychopathy is underpinned by a (heritable) affective deficit, whereas secondary psychopathy reflects an (environmentally acquired) affective disturbance. Because the secondary psychopaths' hostile, callous behavior can be understood as an emotional adaptation to such factors as parental rejection and abuse, secondary psychopaths are viewed as more amenable to treatment than primary psychopaths (see Skeem et al., 2003). Thus, a theoretical basis for distinguishing between variants has developed over the last half century.

The multidimensional structure of the PCL–R also suggests that there might be variants of psychopathy: The availability of more

than one dimension conveys the possibility of variants with different trait constellations. The traditional PCL–R model of psychopathy involves two correlated factors: Factor 1 comprises the interpersonal and affective traits of emotional detachment, and Factor 2 comprises the behaviors of a criminal and socially deviant lifestyle (Harpur, Hare, & Hakstian, 1989; see also Hare, 1991). More recent research suggests that the PCL–R is underpinned by three (Cooke & Michie, 2001; Cooke, Michie, Hart, & Clark, 2004) or four (Hare, 2003) factors, which we call *facets*. The presentation of competing models has sparked a debate about whether antisocial behavior is an inherent component of psychopathic personality disorder (four facets) or merely a potential consequence of the core traits (three facets). The debate aside, several authors have argued that different score configurations across two, three, or four dimensions of the PCL–R (e.g., Hervé, Ling, & Hare, 2000; Mealey, 1995) may be characteristic of specific variants of psychopathy.

In addition to these measure-based and theoretical suggestions that there are variants of psychopathy, research indicates that those with high PCL–R scores are indeed a heterogeneous group. A sizeable proportion of psychopathic offenders (a) do not reoffend during or after incarceration (see Hemphill, Templeman, Wong, & Hare, 1998; Salekin, Rogers, Ustad, & Sewell, 1998) and (b) are relatively responsive to treatment efforts (Hare, Clark, Grann, & Thornton, 2000). These findings challenge the assumption that the criminal behavior of those diagnosed with psychopathy is immutable and raise the possibility that there are variants of psychopathy with different pathways into and out of such behavior. This possibility has key implications for violence risk assessment, management, and treatment. Thus, there are practical as well as theoretical reasons for disaggregating psychopathy. The question is where to look for variants. What characteristics or life events distinguish one variant from another?

Where to Look for Variants

Most theories postulate that primary psychopathy has a genetic basis, whereas secondary psychopathy has an environmental basis (for reviews, see Skeem et al., 2003; Poythress & Skeem, 2006). To study these etiological distinctions, a behavior genetic design is necessary. In the present study, we focused instead on phenotypic distinctions, including (a) trait anxiety; (b) psychopathic trait constellations; (c) interpersonal behavior; (d) borderline and narcissistic traits; and (e) clinical features, including treatment response.

Trait Anxiety

Trait anxiety, or the disposition to feel anxious across time and situations, is central to Karpman's (1941, 1948) distinction between primary and secondary variants of psychopathy. Like Cleckley (1964), Karpman (1948) believed that a pronounced lack of anxiety marked the primary psychopath, who had the "instinctive emotional organization of a subhuman animal" (p. 533). Karpman (1948) often cast the secondary psychopath as a neurotic character who experienced intense anxiety rooted in early psychosocial learning.

The premise that "high-anxious" and "low-anxious" psychopaths are distinguishable groups enjoys considerable empirical support. The PCL–R includes no direct assessment of anxiety, and total PCL–R scores are uncorrelated with various measures of anxiety (Schmitt & Newman, 1999). Thus, the PCL–R seems to identify a heterogeneous group as psychopathic, rather than identifying a core group of fearless, unworried primary psychopaths. In fact, high- and low-anxious psychopaths can be meaningfully differentiated (Kosson & Newman, 1995). Only low-anxious (primary) psychopaths show deficits in passive avoidance learning (Arnett, Smith, & Newman, 1997; Newman & Schmitt, 1998), modulation of responses to emotional and neutral stimuli (Hiatt, Lorenz, & Newman, 2002; Lorenz & Newman, 2002; Newman, Schmitt, & Voss, 1997), and fear-potentiated startle response (Sutton, Vitale, & Newman, 2002). High-anxious (secondary) psychopaths do not show these putative etiological markers. Disaggregating psychopathy on the basis of trait anxiety produces groups with theoretically coherent differences in their performances on laboratory measures. Trait anxiety is a promising place to look for variants of psychopathy.

Psychopathic Trait Constellations

According to some theorists (e.g., Karpman, 1941, 1948; Porter, 1996), primary and secondary psychopaths are virtually indistinguishable in their levels and patterns of psychopathic traits. Similarities between the variants may swamp such subtle differences as the primary psychopaths' greater ability to use people for their own purposes (Porter, 1996) and secondary psychopaths' occasional manifestation of a positive social trait or emotion (Karpman, 1941). However, other theorists (e.g., Levenson, Kiehl, & Fitzpatrick, 1995; Mealey, 1995) posit that primary psychopaths have more pronounced traits of emotional detachment (PCL–R Factor 1 or Facet 2), whereas secondary psychopaths display more impulsivity, hostility, and social deviance (PCL–R Factor 2; Mealey, 1995).

There is indirect support for the notion that variants differ in their psychopathic traits. Research links traits in a theoretically relevant manner to Factor 1 (emotional detachment, relevant to primary psychopathy) and Factor 2 (social deviance, relevant to secondary psychopathy). First, measures of anxiety inversely relate to psychopathy scales that assess Factor 1 and positively relate to those that assess Factor 2 (Frick et al., 2000; Hare, 1991; Verona, Patrick, & Joiner, 2001). Second, deficits in affective processing on laboratory tasks correlate more strongly with Factor 1 than Factor 2 (Harpur et al., 1989; Patrick, Zempolich, & Levenston, 1997). This is in keeping with the notion that primary, but not secondary, psychopaths have an affective deficit. Third, Factor 1 often explains little variance in violence and aggression, relative to Factor 2 (e.g., Salekin, Rogers, & Sewell, 1996; Skeem & Mulvey, 2001). This is consistent with theories that the secondary psychopath is the more "hot headed," reactive, and impulsive of the two variants (Karpman, 1948). Although the secondary psychopath is more hostile and frequently violent (e.g., involved in fights), the primary psychopath will callously use violence (e.g., premeditated murder) when it provides a means of achieving control over and exploiting others (see Hall, Benning, & Patrick, 2004; Woodworth & Porter, 2002). This research suggests that primary and secondary psychopaths would obtain relatively high scores on Factor 1 and Factor 2, respectively.

Interpersonal Behavior

Primary and secondary psychopaths may also be distinguished on the basis of their interpersonal patterns. Blackburn (1968, 1971) identified a four-fold typology of mentally disordered offenders by cluster analyzing Minnesota Multiphasic Personality Inventory (MMPI) profiles of forensic patients. He labeled two of these clusters primary and secondary psychopaths. This typology has been replicated by other investigators (for a review, see Blackburn, 1998b; Morrison & Gilbert, 2001). Over the past 3 decades, Blackburn (1999) has studied these variants of psychopathy, chiefly using MMPI-based measures of belligerence (impulsive aggression vs. control) and withdrawal (withdrawal vs. sociability), which are moderately associated with the PCL–R.

According to Blackburn (1975, 1998b), the chief distinction between primary and secondary psychopaths lies in their degree of withdrawal. Although both variants are belligerent, the primary psychopath is extraverted, confident, dominant, and low to average in anxiety, whereas the secondary psychopath is withdrawn, low in self-confidence, submissive, moody, and emotionally disturbed. These variants differ in theoretically coherent ways in their aggression, symptoms and diagnoses, arousal, and interpersonal behavior (for a review, see Blackburn, 1998b; Morrison & Gilbert, 2001). For example, relative to primary psychopaths, secondary psychopaths endorse significantly more autonomic arousal in response to a set of hypothetical scenarios describing attack and frustration (Blackburn & Lee-Evans, 1985). Thus, interpersonal behavior is a promising place to look for variants of psychopathy.

Borderline and Narcissistic Traits

Variants may also be discriminated on the basis of borderline and narcissistic traits. Blackburn (1996) described secondary psychopaths as "predominantly borderline personalities" (p. 19) with disturbed emotional capacities that manifest in hostile reactivity. In contrast, narcissistic traits of dominance, grandiosity, egocentricity, and entitlement may be markers of primary psychopathy (see Skeem et al., 2003). In keeping with this view, borderline personality disorder is more strongly associated with PCL–R Factor 2 than Factor 1, and narcissistic personality disorder is more strongly associated with PCL–R Factor 1 than Factor 2 (e.g., Hart & Hare, 1989; Rutherford, Alterman, Cacciola, & McKay, 1997; Shine & Hobson, 1997). Similarly, Blackburn found that secondary psychopaths qualify more often for diagnoses of borderline personality disorder than do primary psychopaths, who more often have antisocial and narcissistic disorders (Blackburn, 1998a; Blackburn & Coid, 1999).

Clinical Features

Variants may also be distinguished on the basis of their clinical features: major mental disorder, clinical functioning, and responsiveness to treatment. Relative to primary psychopaths, theorists have viewed secondary psychopaths as more psychopathological (particularly concerning negative affectivity), low functioning, and potentially responsive to traditional treatment (Blackburn, 1998b; Karpman, 1941; Porter, 1996).

Taking Stock of Variants That Have Been Found

With the exception of Blackburn's (1999) work reviewed above, early attempts to identify variants of adult psychopathy have consisted of exploratory cluster analyses with few a priori hypotheses. Nevertheless, their results generally are consistent with primary and secondary variants. Haapasalo and Pulkkinen (1992) cluster analyzed 18 PCL items, and identified three groups in a sample of 92 nonviolent Finnish prison inmates. Of the two groups with relatively high PCL scores, Cluster 1 obtained elevated scores on Factor 1 Emotional Detachment, and Cluster 2 obtained elevated scores on Factor 2 Social Deviance. One might interpret these as primary and secondary variants. Using a sample of 252 male methadone patients, Alterman et al. (1998) cluster analyzed four measures of antisociality and psychopathy and identified six groups. Three groups (1, 2, and 5) had relatively high PCL scores. Patients in Clusters 1 and 2 manifested severe anxiety, depression, and substance abuse problems, unlike patients in Cluster 5. The psychopathological clusters may represent secondary variants, whereas the relatively healthy one represents a primary variant.

More recently, Vassileva, Kosson, Abramowitz, and Conrod (2005) cluster analyzed a sample of 200 jail inmates' scores (PCL–R total $M = 25$) on several measures thought to distinguish between primary and secondary psychopathy: the two factors of the PCL–R, an interpersonal measure of psychopathy, and measures of anxiety and substance abuse. The authors identified four clusters, one of which obtained relatively low PCL–R scores. They labeled the three remaining groups secondary psychopaths, primary psychopaths, and criminals with features of psychopathy. Secondary psychopaths (30% of the sample) had significantly greater anxiety and substance abuse symptoms than the remaining groups. Primary psychopaths (17% of the sample) had significantly (though modestly) higher Factor 1 and interpersonal traits of psychopathy. Criminals with features of psychopathy (26% of the sample) had few distinguishing features, other than (counterintuitively) having the lowest trait anxiety scores of the three groups and lying midway between primary and secondary psychopaths in interpersonal traits of psychopathy. The authors compared these groups on demographic characteristics and criminal histories. Chiefly, they found that the secondary group had more prior nonviolent charges, and the primary group had more prior violent charges and institutionalizations, than the remaining groups. However, this validation strategy is vulnerable to problems of criterion contamination, as prior criminality is directly considered in scoring the PCL–R factors used to derive the clusters.

As a group, these studies have several limitations. First, most are not theoretically driven and, thus, may not include measures on which variants maximally differ. Second, all apply traditional cluster analytic methods that can and do find clusters where none exist. These methods involve a number of inherent uncertainties that include choosing the number of clusters to retain. Third, the studies are based on heterogeneous samples in which only a small proportion is psychopathic. It is unclear the extent to which the variants identified are variants of psychopathy per se.

A recent study by Hicks, Markon, Patrick, Krueger, and Newman (2004) overcomes many of these limitations. To identify variants of psychopathy, these investigators selected a sample of 96 psychopathic inmates (PCL–R total ≥ 30) and then applied model-based cluster analysis to these inmates' scores on a self-report measure of 11 general personality dimensions. As the authors hypothesized, a two-cluster solution fit the data best, and these clusters were consistent with theoretical distinctions between primary and secondary psychopathy. The primary psychopathy

cluster, which they labeled *emotionally stable psychopaths* (*n* = 30), reported high social dominance and fearlessness, and low anxiety, impulsivity, and aggressiveness. In contrast, the secondary psychopathy cluster, which they labeled *aggressive psychopaths* (*n* = 66), was characterized by high aggressiveness, reactive hostility, impulsiveness, and anxiety. Relative to a group of nonpsychopathic control prisoners, secondary psychopaths manifested markedly greater negative affectivity, aggression, and alienation, and less general well-being. Relative to primary psychopaths, secondary psychopaths reported more childhood and adult fights, greater alcohol abuse, lower socialization, and higher trait anxiety. Despite these differences, primary and secondary variants were indistinguishable in their psychopathic traits, as assessed by the PCL–R (total and Factor 1 Emotional Detachment scores). Although statistically significant, the secondary group's score on Factor 2 Social Deviance was only slightly higher than that of the primary group. Despite this study's considerable strengths, the approach used to identify variants (i.e., clustering psychopaths' scores across general personality dimensions) is only one of several promising approaches that could be applied to increase our understanding of variants of psychopathy (Poythress & Skeem, 2006). In the present study, we applied an alternative approach because knowledge claims about variants of psychopathy rest on a solid foundation when they have been tested across diverse designs. That is, when a finding holds across a "heterogeneity of irrelevancies"—or variation in persons, settings, treatments, and measures that are presumed irrelevant—the validity of the knowledge claim earns compelling support (see Shadish, 1995, p. 425).

In summary, a handful of studies has explored variants of psychopathy. Despite the limitations of, and differences in, their approaches, the convergence among the studies' results provides some support for distinguishing between primary and secondary psychopathy. Relative to primary psychopaths, secondary psychopaths manifest more features of psychopathology, including anxiety and mood disorders (Alterman et al., 1998; Blackburn, 1998b; Haapasalo & Pulkkinen, 1992; Vassileva et al., 2005), more substance abuse (Alterman et al., 1998; Vassileva et al., 2005), more interpersonal hostility and aggression (Blackburn, 1998b; Hicks et al., 2004), less social dominance (Blackburn, 1998b), and fewer affective deficits (Haapasolo & Pulkkinen, 1992).

The Present Study

The present study was designed to investigate whether there are variants of psychopathy in a relatively homogeneous subgroup of violent, psychopathic inmates. The selection of this subgroup, the clustering variables, and the criterion variables were guided by theory and research on primary and secondary variants of psychopathy. First, we applied model-based cluster analysis to identify any subgroups of violent, psychopathic inmates who differed in their pattern of psychopathic features, degree of antisocial behavior, and level of trait anxiety. Given the purported difficulty of distinguishing between variants on the basis of psychopathic features and mixed empirical findings to date, we hypothesized that the main dimension of distinction between any subgroups would be trait anxiety. We allowed for the possibility that secondary psychopaths might manifest less emotional detachment and greater social deviance than primary psychopaths. Second, we assessed the external validity of the resulting subgroups by deter-

mining whether they differed in a theoretically coherent manner in their Cluster B (American Psychiatric Association [APA], 2000) traits (i.e., borderline and narcissistic), social interactions (i.e., irritability, social withdrawal, lack of assertiveness), and clinical features (i.e., major mental disorder, poor clinical functioning, greater responsiveness to treatment). We hypothesized that secondary psychopaths would be higher on each domain than primary psychopaths.

Method

Participants

In Sweden, men who receive prison sentences of 4 years to life are sent to the National Reception Unit for psychological assessment. Study participants (*N* = 367) were a subset of the men assessed at the unit over a 7-year period (1997–2004) whose primary conviction was for a violent (but nonsexual) crime. The sample represents violent, long-term prisoners rather than the general prison population: 40% of the sample was sentenced for attempted murder, murder, or manslaughter, compared with only 14% of the general prison population (Swedish Prison and Probation Services, 2003). The sample's average PCL–R score was 22.0 (*SD* = 10.3).

For cluster analyses, we selected 123 inmates who obtained PCL–R scores in the top one third of this sample's distribution. We used this selection approach because research indicates that psychopathy is dimensional rather than taxonic: Psychopaths differ from regular population in degree, rather than in kind (for a review, see Edens, Marcus, Lilienfeld, & Poythress, 2006). We wished to analyze a portion of the sample with substantial psychopathic traits. Because the upper third of our sample obtained PCL–R total scores of 29 and higher, and scores of 30 or higher traditionally are accepted for diagnosing psychopathy (Hare, 2003), our results are informative whether one adopts a dimensional or taxonic view of the construct. Virtually all (92%) participants' PCL–R scores exceeded the traditional threshold for diagnosing psychopathy (*M* = 33.2, *SD* = 2.7).

We chose to cluster analyze this subgroup rather than the entire sample because we were interested in variants of individuals high in psychopathic traits, not in variants of violent long-term prisoners. Reasoning by analogy, if one wished to identify subtypes of beetles, one would conduct cluster analyses on beetles, not on beetles, butterflies, termites, and ants combined into one large sample. If we were to find insufficient variance within the psychopathic subgroup to perform clustering, this would be informative about the likelihood (or lack thereof) of subtypes within this subgroup.

Psychopathic participants (*n* = 123) were relatively young men (*M* = 30.7 years, *SD* = 8.9) who had been sentenced for murder (37%), robbery (28%), attempted murder (17%), assault (14%), or other violent offenses (4%). The remaining nonpsychopathic participants (*n* = 243) with PCL–R total scores below 29 (*M* = 16.3, *SD* = 7.7) were used as a comparison group. There were no significant Bonferroni-corrected differences between the psychopathic group and the comparison group in age or index offense.

Measures

Psychopathy and antisocial behavior. The PCL–R (Hare, 1991, 2003) consists of 20 items, rated on a 3-point scale by

trained raters (0 = *item definitely does not apply* to 2 = *item definitely applies*). The ratings are based on a lengthy semistructured interview and review of file information. Total scores range from 0 to 40 and are interpreted to represent the degree to which the individual resembles the prototypical psychopath.

As noted earlier, several structural models for the PCL–R have been derived. Given cross-sectional evidence that core psychopathic traits summarized by three facets (Cooke & Michie, 2001) may produce antisocial behavior (Cooke et al., 2004), and that antisocial behavior items are not particularly informative about the latent trait of psychopathy (Cooke & Michie, 2001), we computed composite scores to represent (a) arrogant and deceitful interpersonal style (α = .84), (b) deficient emotional experience (α = .83), and (c) impulsive and irresponsible behavioral style (α = .84). We also computed a composite score to represent (d) antisocial features (Hare, 2003; α = .81) that are not specific to psychopathic personality deviation (Cooke at al., 2004; cf. Neumann, Vitacco, Hare, & Wupperman, in press).

Raters in this study were two psychologists who completed a 2-day PCL–R workshop and a post-workshop training course that included working through eight standardized videotaped cases. During the study, interrater reliability was calculated for a subsample of 32 inmates who were independently rated by these two psychologists. Using a two-way mixed effects model and the Spearman–Brown Prophecy Formula, intraclass correlation coefficients were computed for a single rating (ICC_1) and the average of two independent ratings (ICC_2). The results indicate acceptable levels of interrater reliability (ICC_1 = .84; ICC_2 = .91).

Other personality disorders and functioning. The Diagnostic Interview of Personality Questionnaire (DIP-Q; Ottosson et al., 1995) is a 140-item, true–false, self-report questionnaire designed to measure all 10 personality disorders in the American Psychiatric Association's (2000; APA) *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM–IV*) and all 8 disorders in the World Health Organization's (1992) *International Classification of Diseases*. In the present study, scales for half of the disorders (paranoid, schizotype, antisocial, borderline, narcissistic) manifested acceptable internal consistency ($\alpha \geq$ .69). Poorer internal consistency indicates that results for the following scales should be interpreted with caution: Schizoid (α = .54), Histrionic (α = .57), Avoidant (α = .50), Dependent (α = .65), and Obsessive (α = .44). A self-report version (Bodlund, Kullgren, Ekselius, Lindstron, & von Knorring, 1994) of the Global Assessment of Functioning Scale (GAF; APA, 1994) is also included in the questionnaire, with scores ranging from 0 (severely impaired functioning) to 100 (high functioning).

Personality traits. The Karolinska Scales of Personality (KSP; Gustavsson, Weinryb, Göransson, Pedersen, & Åsberg, 1997) is a 135-item, self-report inventory of personality traits that has been validated with both community and psychiatric patient samples (e.g., Ekselius, Hetta, & von Knorring, 1994; cf. Klinteberg, Humble, & Schalling, 1992). Respondents indicate their agreement with each item on a scale ranging from 1 (*does not apply at all*) to 4 (*applies completely*). The 15 traits measured include psychic anxiety/trait anxiety (worry, insecurity, anticipatory and social anxiety), somatic anxiety (autonomic symptoms, concentration difficulties, vague distress, panic), muscular tension (tension in muscles, trembling, feeling stiff, gnashing jaws), psychasthenia/stress susceptibility (easily fatigued, uneasiness when urged to

speed up and face new tasks), inhibition of aggression/lack of assertiveness (sadness rather than anger when scolded, not being able to speak up), detachment/distance (avoiding involvement with others, withdrawn behavior), impulsivity (acting on the spur of the moment, not planning, preference for speed rather than accuracy, carelessness), monotony avoidance/sensation seeking (avoiding routine tasks, proneness to boredom, need for change and excitement), socialization (positive childhood experiences, good school and family adjustment, general satisfaction), indirect aggression (sulking and slamming doors when angry), verbal aggression (getting into arguments, telling people off when annoyed), irritability (irritable behavior, lack of patience), suspicion (distrust of people's motives), guilt (remorsefulness, being ashamed of bad thoughts), and social desirability (responding in a socially approved way, socially conforming, friendly, helpful, or "faking good"). With the exception of three scales that should be interpreted with caution (Monotony Avoidance, α = .68; Irritability, α = .63; Social Desirability, α = .63), internal consistency for the KSP scales was acceptable ($\alpha \geq$ .69).

Violence risk variables. The Historical, Clinical, Risk Management—20 (HCR–20; Webster, Douglas, Eaves, & Hart, 1997) is a heavily researched instrument that structures professional decisions about violence risk by encouraging consideration of 20 risk factors for violence that were identified through literature reviews (see, e.g., Douglas & Weir, 2003). Each risk factor is scored on a 3-point scale ranging from 0 (*not present*) to 2 (*present*). The HCR–20 has acceptable interrater reliability and has proven useful in predicting general aggression and violent recidivism among mentally disordered offenders (for reviews, see Douglas & Weir, 2003). In the present study, two HCR–20 items relevant to distinguishing between psychopathy variants were used: (a) major mental illness (H-6) or the presence of a *DSM–IV* (APA, 2000) major mental disorder like psychosis; and (b) treatment responsivity (C-5), specifically, lack of responsiveness to past treatment and poor prognosis for future treatment.

Procedure

Assessment took place an average of 2 weeks after inmates arrived at the National Reception Unit. Participants were informed that the purpose of the assessment was to estimate their risk of future misbehavior and to decide their most appropriate prison placement. Psychologists remained on hand to address any questions that arose during participants' completion of the self-report measures. Assessments took an average of 5 hr to complete and were administered in two sessions in a private room.

Statistical Analyses

Model-based cluster analysis was used to address the primary study aim. Traditional cluster analyses that apply different rules of group formation can and do produce different solutions for identical data sets (Aldenderfer & Blashfield, 1984). Even using the same traditional method of cluster analysis, alterations in the participant pool and variable set can produce different solutions. Moreover, commonly used hierarchical clustering methods require that the investigator use his or her best judgment or rules of thumb to determine the number of clusters to retain. Even the best of these rules performs poorly in determining whether there are no clusters

in the data versus one or more clusters (Tonidandel & Overall, 2004). Traditional cluster analyses will apply structure where none exists.

In an effort to address such issues, we applied model-based cluster analysis in this study (Banfield & Raftery, 1993), using the SPLUS 6.2 statistical software package and the mclust library (Fraley & Raftery, 2002). This form of analysis reduces some of the uncertainties inherent in common clustering methods by testing the relative fit of six models that vary in their assumptions about the structure of the data. Specifically, they vary in their assumptions about the distribution of clusters (spherical, diagonal, or ellipsoidal) and whether the clusters have equal or variable size, shape, and orientation in space. The cluster characteristics associated with the six models are (a) spherical, with equal volume and shape; (b) spherical, with variable volume and equal shape; (c) diagonal, with equal volume and shape; (d) diagonal, with variable volume and shape; (d) ellipsoidal, with equal volume, shape, and orientation; and (e) ellipsoidal, with variable shape, volume, and orientation. Within each of these six models, the number of clusters is varied from 1 to 9. To maximize the likelihood of finding the underlying data structure(s), then, the default routine generates and tests 54 different cluster solutions. To generate each solution, the routine applies a fit criterion to estimate the number of clusters, assignment of each participant to a cluster, and average vector and covariance matrix of the clustering variables for each cluster.

Results

The first aim of the study was to assess whether there were subgroups of PCL–R psychopaths with distinct trait patterns. To address this aim, we applied model-based cluster analysis to in-mates' ($n = 123$) psychopathy scores (PCL–R Facets 1–3), anti-social behavior (PCL–R Facet 1), and trait anxiety (KSP Psychic Anxiety). This was the cluster derivation stage of analysis. The second aim of the study was to assess the extent to which any subgroups derived via model-based cluster analysis matched the-oretical conceptions of primary and secondary psychopathy. To address this aim, we compared the derived subgroups across traits, social or interpersonal behavior, and clinical characteristics that were not used to derive the subgroups. This was the cluster validation stage of analysis. To further describe the derived sub-groups, we compared their scores descriptively with those of the nonpsychopathic control group ($n = 243$) across several person-ality scales. This was the descriptive stage of analysis.

Cluster Derivation

Model-based cluster analysis was applied to psychopathic in-mates' Z scores on the five variables (tapping psychopathy, anti-social behavior, and anxiety) listed earlier. As shown in Figure 1, models that specified one cluster fit relatively poorly, indicating that there were subgroups of inmates with distinctive trait patterns. The two best fitting models were a two-cluster solution with spherical groups that varied in volume (Model 2: Bayesian infor-mation criterion [BIC] = –1743) and a five-cluster solution with diagonal groups of equal volume (Model 3: BIC = –1747). The remaining models fit the data substantially worse than the best fitting model (BIC < –1753). When comparing models, we con-sidered a difference in BIC of 0 to 2 as weak support for the better fitting model, 2 to 6 as positive support, 6 to 10 as strong support, and greater than 10 as very strong support (Raftery, 1995). The difference in BIC fit of 4 between the two best fitting models
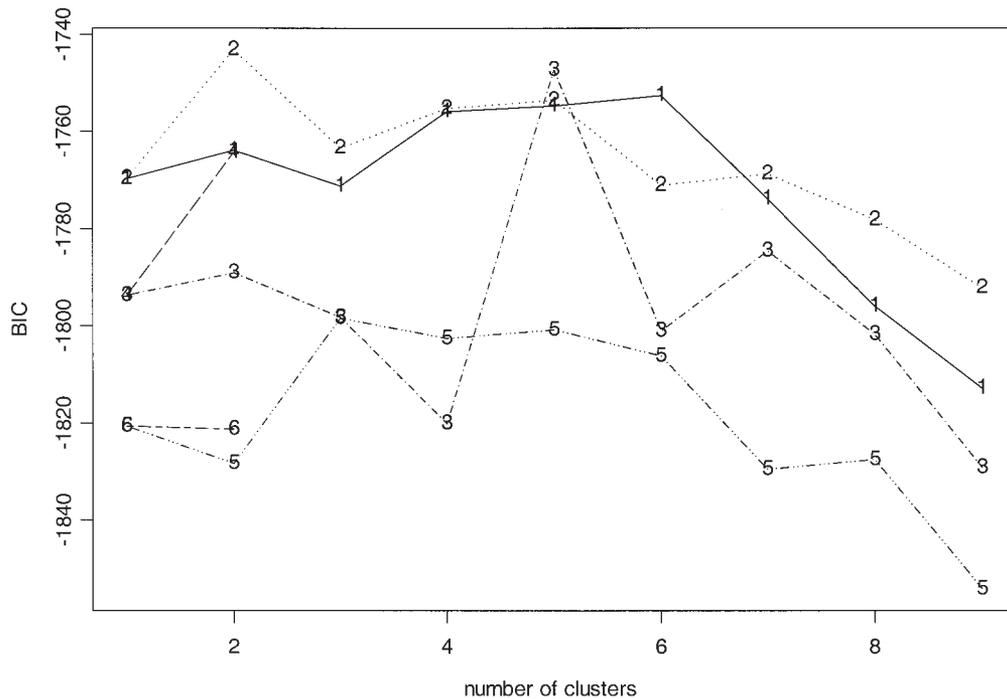

Figure 1. Relative fit of 54 cluster solutions. BIC = Bayesian information criterion.

provides positive support for the two-cluster model, indicating that the two-cluster model is at least 5 times more likely to be the better fitting model than the next best fitting model, the five-cluster model (Raftery, 1995). The two-cluster solution (Model 2) was ultimately selected because it was better fitting, more parsimonious, more stable across data subsamples and variable sets, and manifested the most coherent pattern of differences across theoretically relevant variables that were not used to derive the solution.

For this two-cluster solution, the average classification certainty, or posterior probability that an individual was correctly assigned to a cluster, was high (87%). Three quarters of the sample had a fairly high ($\geq$ 80%) probability of correct assignment to a cluster. Thus, the cluster solution seems to be dependable, and the number of clusters is compatible with the idea that there are primary and secondary variants of psychopathy.

Cluster Validation

Having identified two spherical clusters of varying volume (n = 49, n = 74), the next question was the extent to which these clusters are consistent with theoretical conceptions of secondary and primary psychopathy. To address this issue, we compared the two clusters on the variables used to derive them, as well as on variables that were not used to derive them but were theoretically related.

Description of clusters. For descriptive purposes, we computed t tests to compare the two clusters across the five variables used to derive them (a multivariate analysis of variance was not conducted first because the groups, by definition, will differ on the variables used to create them). Relative to primary psychopaths, we expected secondary psychopaths to (a) have greater anxiety and (b) be either similar in their psychopathic traits or have fewer interpersonal and affective traits of psychopathy and greater lifestyle traits of psychopathy and antisocial behavior. As shown in Table 1, which depicts Z scores (based on the psychopathic subsample), the distinction between primary and secondary psychopaths largely held. The cluster we labeled secondary psychopathy (n = 49) had greater anxiety and fewer psychopathic traits (Facets 1, 2, and 3) than the cluster we labeled primary psychopathy (n = 74). The two groups did not differ in their levels of antisocial behavior (Facet 4). These findings are in keeping with the premise that anxiety is a main differentiator between psychopathy variants

(Karpman, 1941, 1948), and in contrast with some theorists' (e.g., Levenson et al., 1995; Mealey, 1995) proposals that variants differ in their patterns of psychopathic traits. Although the secondary variant obtained lower total PCL–R scores (M = 31.8, SD = 2.4) than the primary variant (M = 34.2, SD = 2.5), t(121) = –5.3, $p <$ .001, both variants' average scores were in the psychopathic range.

External validation of clusters. By definition, clusters will differ on the variables used to derive them. To determine whether the clusters exist and are meaningful, the subgroups derived must be shown to differ across variables that were not used to derive them, but are theoretically relevant dimensions for distinguishing the groups. The theories presented in the introduction posit that, relative to primary psychopaths, secondary psychopaths should manifest more borderline traits, fewer narcissistic traits, more impulsivity, more irritability, more social withdrawal, less social assertiveness, more major mental illness, poorer clinical functioning, and better response to treatment. To test this hypothesis, we compared the two groups defined by the cluster analysis via multivariate analysis of variance across the nine variables that operationalized these constructs. PCL–R total scores were used as a covariate to control for any differences between the two groups associated with general levels of psychopathy per se.

The results indicated that the two groups are significantly and meaningfully related to variables that are theoretically relevant to distinguishing between primary and secondary psychopathy. Using Wilks's criterion, we found that the two clusters differed significantly across this group of variables after controlling for PCL–R total scores, F(9, 96) = 4.39, $p <$ .001. There was a moderate relationship between group membership and these dependent variables (partial η^2 = .29). The group means for each variable are presented in Table 2. To aid interpretation, we used Z scores (within the psychopathic group). Relative to primary psychopaths, secondary psychopaths manifested significantly more borderline traits (DIP-Q), irritability (KSP), social withdrawal (KSP), lack of assertiveness (KSP), and major mental illness (HCR–20), and significantly poorer clinical functioning (GAF, past year, DIP-Q). Contrary to the hypotheses, secondary psychopaths were neither more impulsive (KSP) nor less narcissistic (DIP-Q) than primary psychopaths. There was a nonsignificant trend for secondary psychopaths to be more responsive to treatment efforts than primary psychopaths. These results generally support the external validity of our primary and secondary subgroups.

Table 1

Differences Between Variants' Z Scores Across Variables Used in the Cluster Analysis

Variable	Primary (n = 74)		Secondary (n = 49)		
	M	SD	M	SD	t
Arrogant and deceitful interpersonal style (PCL-R Facet 1)	−0.38	1.2	0.24	0.7	−3.5[***]
Deficient emotional experience (PCL-R Facet 2)	−0.45	1.3	0.29	0.5	−4.2[****]
Impulsive and irresponsible behavioral style (PCL-R Facet 3)	−0.37	1.3	0.26	0.6	−3.6[****]
Antisocial behavior (PCL-R Facet 4)	−0.07	1.3	.05	0.7	−0.66
Anxiety (KSP, Psychic Anxiety)	−0.52	1.1	.34	.75	5.10[****]

Note. Revised Psychopathy Checklist (PCL-R) Facets 1–3 from Cooke and Michie's (2001) model; antisocial Facet 4 from Hare's (2003) PCL-R manual. KSP = Karolinska Scales of Personality.
[***] $p <$ .01.   [****] $p <$ .001.

Table 2
Differences Between Variants' Z Scores Across External Validation Variables

Variable	Primary (n = 66)		Secondary (n = 41)		
	M	SD	M	SD	F
Traits					
Borderline (DIP-Q)	−0.16	0.8	0.29	1.2	9.5***
Narcissistic (DIP-Q)	0.06	1.0	−0.12	1.0	0.1
Impulsivity (KSP)	−0.03	0.9	0.06	1.1	0.6
Social					
Irritability (KSP)	−0.15	0.9	0.19	1.1	4.2**
Social withdrawal (KSP, Detachment)	−0.11	0.9	0.27	1.1	4.0**
Lack of assertiveness (KSP, Inhibit. Agg.)	−0.22	0.9	0.42	1.0	15.1****
Clinical					
Major mental illness (HCR-20, H-6)	−0.20	0.4	0.27	1.5	6.0**
Clinical functioning (GAF, past year, DIP-Q)	0.16	1.0	−0.30	1.0	12.7****
Unresponsive to treatment (HCR-20, C-5)	0.23	0.6	−0.32	1.3	2.8*

Note. F values were computed controlling for Revised Psychopathy Checklist (PCL-R) total scores. DIP-Q = Diagnostic Interview of Personality Questionnaire; KSP = Karolinska Scales of Personality; HCR-20 = Historical, Clinical, Risk Management-20; GAF = Global Assessment of Functioning Scale; Inhibit. Agg. = Inhibition of Aggression.
$^*p < .10.$ $^{**}p < .05.$ $^{***}p < .01.$ $^{****}p < .001.$

Description of Psychopathic Variants and the Nonpsychopathic Comparison Group

Descriptive differences. To provide a supplemental description of the differences between the two clusters of psychopaths in their traits and trait constellations, we compared the subgroups on the remaining KSP and DIP-Q variables. As shown in Table 3, secondary psychopaths had significantly more traits of avoidant and dependent personality disorders than primary psychopaths. Similarly, secondary psychopaths had greater somatic anxiety and muscular tension and were more prone to sulking and other indirect expression of aggression. Thus, although there were few

Table 3
Differences Between Variants' Raw Scores Across Descriptive Variables

Variable	Primary (n = 66)		Secondary (n = 41)		
	M	SD	M	SD	t
Personality disorders symptoms (DIP-Q)					
Antisocial	3.0	1.9	3.2	2.0	0.5
Histrionic	1.4	1.9	1.9	1.5	1.4
Paranoid	2.8	1.9	2.8	2.2	0.1
Schizoid	1.0	1.0	1.4	1.4	1.6
Schizotype	2.4	1.7	3.0	1.9	0.1
Avoidant	1.1	1.3	2.5	2.1	4.6****
Dependent	0.9	1.3	1.9	2.0	3.1***
Obsessive	2.6	1.6	3.0	1.6	1.6
Personality traits (KSP t scores)					
Somatic anxiety	52.7	10.6	58.8	17.5	2.4**
Muscular tension	54.3	15.7	62.8	17.5	3.2***
Social desirability	54.1	11.2	57.1	10.5	0.3
Monotony avoidance	50.5	14.2	50.6	13.1	0.0
Psychoasthenia (stress susceptibility)	50.5	10.1	57.8	15.2	3.1***
Socialization	32.1	10.7	29.0	13.8	−1.4
Indirect aggression	50.5	8.8	54.4	11.1	2.1**
Verbal aggression	52.0	10.7	52.3	13.2	0.9
Suspiciousness	50.0	11.5	52.1	12.1	0.9
Guilt	51.7	10.0	53.4	12.9	0.9

Note. t values were computed controlling for Revised Psychopathy Checklist (PCL-R) total scores. DIP-Q = Diagnostic Interview of Personality Questionnaire; KSP = Karolinska Scales of Personality; HCR-20 = Historical, Clinical, Risk Management—20.
$^{**}p < .05.$ $^{***}p < .01.$ $^{****}p < .001.$

significant differences overall, the ones that appeared were theoretically consistent for primary and secondary psychopaths.

Comparison group. To provide a description of primary psychopaths, secondary psychopaths, and the comparison, nonpsychopathic group, we computed *Z* scores on the basis of the entire sample (*N* = 367) rather than exclusively within the high psychopathy group, as before. Each group's pattern across the clustering and external validation variables is shown in Figure 2. In addition, the three groups' raw scores and tests of their differences (based on analysis of variance) are provided for descriptive purposes in Table 4.

As shown in Figure 2 and Table 4, relative to both primary and secondary psychopaths, the comparison group was significantly less psychopathic (PCL–R Facets 1–3), antisocial (PCL–R Facet 4), impulsive (KSP), and narcissistic (DIP-Q), and significantly more responsive to treatment (HCR–20). Relative to primary (but not secondary) psychopaths, the comparison group was significantly more anxious (KSP) and less assertive (KSP). Relative to secondary (but not primary) psychopaths, the comparison group was significantly less anxious (KSP), less borderline (DIP-Q), less irritable (KSP), less withdrawn (KSP), less mentally ill (HCR–20), and higher functioning (GAF). Generally, then, these comparisons are consistent with theoretical distinctions between primary (emotionally stable, dominant) and secondary (emotionally unstable, withdrawn) psychopathy.

Discussion

This study indicates that an ostensibly homogeneous group of violent, psychopathic offenders can be meaningfully disaggregated into subgroups that parallel primary and secondary variants of psychopathy. Relative to primary psychopaths, secondary psychopaths manifested greater trait anxiety, comparable antisocial behavior, and somewhat lower psychopathic traits. These subgroups were externally valid. First, secondary psychopaths manifested more features of borderline personality disorder, poorer interpersonal functioning (irritability, social withdrawal, lack of assertiveness), and poorer clinical functioning (major mental disorder, poor functioning) than primary psychopaths. Second, compared with the violent but nonpsychopathic group (*n* = 243), secondary psychopaths were more emotionally unstable and withdrawn. In contrast, primary psychopaths were less anxious and more assertive or dominant than this comparison group. In this discussion, we address the consistency of these findings with past work on vari-
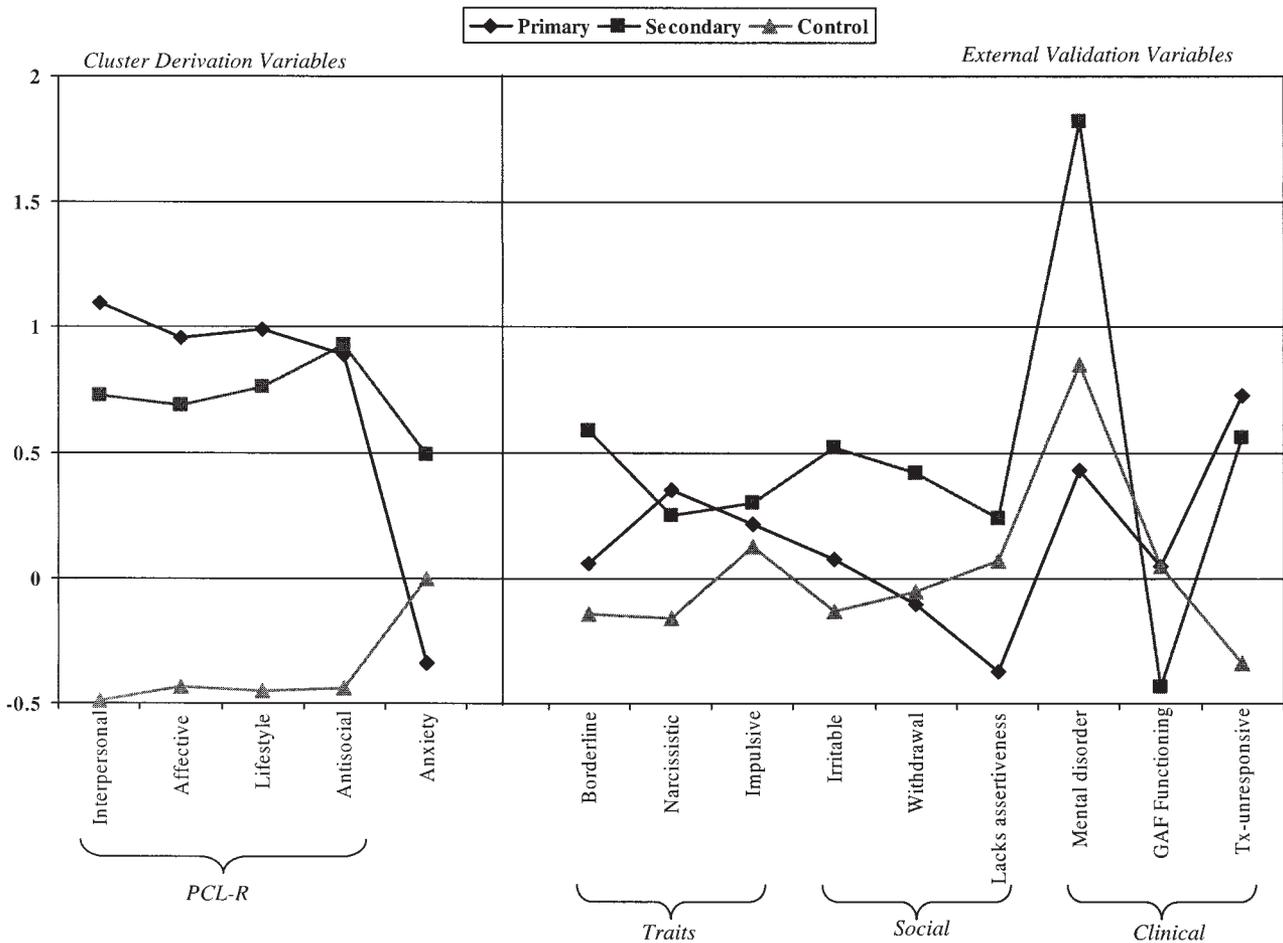

Figure 2. Obtained *Z*-score profiles for psychopathy variants and nonpsychopathic comparison group. PCL–R = Revised Psychopathy Checklist; GAF = Global Assessment of Functioning Scale; Tx = Treatment.

Table 4

Raw Score Differences Between Psychopathic Variants and the Nonpsychopathic Comparison Group: Cluster and Validation Variables

Variable	Primary (n = 74)		Secondary (n = 41)		Comparison (n = 244)		Comparison vs. primary (p)	Comparison vs. secondary (p)
	M	SD	M	SD	M	SD		
Clustering variables								
Arrogant and deceitful interpersonal style (PCL-R Facet 1)	6.4	1.3	5.3	2.2	2.0	2.0	<.001	<.001
Deficient emotional experience (PCL-R Facet 2)	7.7	0.5	7.0	1.3	4.1	2.4		<.001
Impulsive, irresponsible behavioral style (PCL-R Facet 3)	9.5	0.6	8.8	1.5	5.1	2.8	<.001	<.001
Antisocial behavior (PCL-R Facet 4)	8.3	1.1	8.1	2.1	3.9	2.9	<.001	<.001
Anxiety (KSP, Psychic Anxiety)	1.7	0.4	2.2	0.6	1.9	0.5	<.001 <.05	<.01
Validation variables: Traits								
Borderline (DIP-Q)	2.7	1.9	3.9	2.7	2.3	2.1	ns	<.001
Narcissistic (DIP-Q)	2.3	2.2	2.2	2.2	1.4	1.5	<.001	<.05
Impulsivity (KSP)	24.5	5.1	25.0	5.8	22.7	5.0	<.05	<.05
Validation variables: Social								
Irritability (KSP)	10.5	2.7	11.7	3.2	9.9	2.6	ns	<.001
Social withdrawal (KSP, Detachment)	21.5	4.8	24.0	5.7	21.6	4.8	ns	<.01
Lack of assertiveness (KSP, Inhibit. Agg.)	18.2	4.4	21.5	5.7	20.5	5.3	<.01	ns
Validation variables: Clinical								
Major mental illness (HCR-20, H-6)	0.0	0.1	0.2	0.5	0.0	0.3	ns	<.01
Clinical functioning (GAF, past year, DIP-Q)	76.8	17.5	67.8	18.0	77.1	18.3	ns	<.01
Unresponsive to treatment (HCR-20, C-5)	1.9	0.2	1.8	0.5	0.8	1.1	<.001	<.001

Note. Post hoc tests based on Tukey's honestly significant difference (HSD). DIP-Q = Diagnostic Interview of Personality Questionnaire; KSP = Karolinska Scales of Personality; HCR-20 = Historical, Clinical, Risk Management—20; GAF = Global Assessment of Functioning Scale; Inhibit. Agg. = Inhibition of Aggression.

ants of psychopathy, with a focus on implications for identifying variants, studying etiological pathways, and reducing violent behavior.

Identifying Variants

Where not to look? Psychopathic traits and antisocial behavior. Although one other study has focused on offenders with scores in the psychopathic range on the PCL–R (Hicks et al., 2004), this study of psychopathic variants is the first to focus exclusively on violent offenders. Despite the homogeneity of the present psychopathic, violent sample, the clusters we identified were similar to those identified by Hicks et al. (2004). In our study, the two clusters were difficult to distinguish on the basis of psychopathy: Their average PCL–R scores surpassed traditional thresholds for diagnosing psychopathy, were only 2 points apart (M = 32, 34), and summarized similar profiles across psychopathic traits (see Figure 2, Facets 1–3). Similarly, Hicks et al. (2004) found that primary or "emotionally stable" psychopaths obtained slightly lower Factor 2 (lifestyle and antisocial) scores than secondary or "aggressive" psychopaths, but the two clusters were indistinguishable in their core and general psychopathic traits (i.e., PCL–R Factor 1 and total score). These findings contradict theories (e.g., Levenson et al., 1995; Mealey, 1995) that primary psychopaths manifest greater traits of emotional detachment (Factor 1), whereas secondary psychopaths manifest more social deviance and impulsivity (Factor 2).

The lack of such compelling trait differences between psychopathic variants may be based on the sample selected for this study.

First, focusing on individuals with pronounced psychopathic traits may ensure that the subgroups identified have similarly high interpersonal and affective traits of psychopathy, as in both the present and Hicks et al. (2004) studies. Second, focusing on psychopathic individuals who also have been convicted of violent crimes, as in the present study, may ensure that the subgroups identified are relatively similar in their socially deviant behavior (convicted offenders) and impulsive traits (violent offenders). Indeed, studies of nonviolent offenders (Haapasalo & Pulkkinen, 1992) and jail inmates (Vassileva et al., 2005) selected without respect to their degree of psychopathy have identified variants that differ in their PCL–R profiles (although not consistently in the manner predicted by theory, in which Factor 1 is indicative of primary psychopathy, and Factor 2 is indicative of secondary psychopathy). Moreover, variant-consistent correlations between Factors 1 and 2 (e.g., anxiety) have been identified in unselected inmate and other samples. Thus, if primary and secondary psychopathies are conceptualized as trait dimensions, there may be crisper phenotypic distinctions between the two groups at lower levels of the traits and in community (rather than inmate) samples.

Nevertheless, the present study was designed as a rigorous test of the hypothesis that there are primary and secondary variants of extreme psychopathy. Remarkably, even among psychopathic and violent offenders, we identified such variants. In keeping with theories that the two variants behave similarly and manifest only subtle phenotypic differences (Karpman, 1948; Porter, 1996; see also Lykken, 1995), we found no differences between variants in their patterns of psychopathic traits. In this relatively homoge-

neous group of severe offenders, it appears that primary and secondary variants are quite similar in their psychopathic traits.

Where to look: Anxiety and withdrawal. The primary dimension of distinction for the variants found in the present study was in their level of anxiety. This is in keeping with the contrast between Cleckley's (1964) description of primary psychopaths as "very sharply characterized by [a] lack of anxiety (remorse, uneasy anticipation, apprehensive scrupulousness, the sense of being under stress or strain)" (p. 271) and Karpman's (1941) description of secondary psychopaths as "neurotic." This distinction is also consistent with Newman's work on low-anxious (primary) and high-anxious (secondary) psychopaths. Of inmates obtaining high scores on the PCL–R, only those who also have low trait anxiety manifest performance deficits on laboratory performance measures (e.g., Newman & Schmitt, 1998).

Despite such findings, Lykken (1995) has expressed concerns about relying on anxiety to distinguish primary and secondary psychopaths. On the basis of his application of the Fowles–Gray (Fowles & Missel, 1994; Gray, 1987) neurophysiological model, Lykken prefers the construct of fearlessness for distinguishing variants. This model posits that the behavioral inhibition system (BIS) regulates responsiveness to aversive stimuli and is (inversely) associated with fearlessness, whereas the behavioral activation system (BAS) regulates appetitive motivation and is associated with emotionality and impulsivity. According to Lykken, primary psychopathy is associated with a hyporeactive BIS (and average BAS), whereas secondary psychopathy is associated with a hyperactive BAS (and average BIS). Newman, MacCoon, Vaughn, and Sadeh (2005) administered multiple measures of BIS/BAS systems to 517 inmates classified as primary or secondary psychopaths on the basis of their trait anxiety and PCL–R scores. The results were consistent with Lykken's hypothesized pattern for primary psychopaths and partially consistent with that for secondary psychopaths (hyperactive BAS, mixed findings for BIS). This lends credence to the notion of using anxiety as a primary dimension of distinction between these psychopathies, even if fearlessness is also a dimension of distinction.

Alternative models of psychopathy (Cleckley, 1941; Karpman, 1941) emphasize emotional detachment over fearlessness. It will be important in future research to clarify the relation between affective capacities and variants of psychopathy. The present study was limited in its lack of inclusion of laboratory measures of emotional information processing. It remains for future research to determine whether primary psychopathy (an affective deficit) can be dissociated from secondary psychopathy (an affective disturbance) on such measures.

In the absence of such measures, the present study indicated that secondary (high-anxious) psychopaths were most dramatically distinguished from primary (low-anxious) psychopaths by their (a) emotional disturbance (anxiety, major mental and substance abuse disorders, borderline features, impaired functioning), (b) interpersonal hostility (irritability, paranoid features, indirect aggression), and (c) interpersonal submissiveness (lack of assertiveness, withdrawal, avoidant and dependent features). These dimensions are largely consistent with Blackburn's (1998b) well-validated distinction between variants on the basis of their degree of interpersonal dominance (withdrawal) and emotional instability (borderline features). Actually, interpersonal distinctions between the variants are neatly captured by the two axes that organize most cirumplex

models of social behavior (e.g., Benjamin, 2001): dominance (primary > secondary) and hostility (secondary > primary). These axes are consistent with identification of dominant and "emotionally stable" versus alienated and "aggressive" variants of PCL–R psychopaths (Hicks et al., 2004). Primary psychopaths are interpersonally confident, dominant, and free of negative emotionality, whereas secondary psychopaths are withdrawn, hostile, and afflicted with relatively serious emotional problems.

These chief interpersonal and psychopathological dimensions of distinction between primary and secondary psychopathy are not captured by the PCL–R. In the present study, two external validation domains that did not significantly distinguish between variants involved traits closely related to those captured by the PCL–R: narcissistic and impulsive features (overlapping with the PCL–R's grandiose interpersonal traits and impulsive lifestyle traits). As discussed earlier, the two variants appear quite similar in their psychopathic and closely related traits. When assessing violent, psychopathic individuals, inclusion of measures other than the PCL–R (e.g., anxiety, emotional stability, dominance) seems necessary to distinguish between variants.

Studying Etiological Pathways

Making such distinctions will be crucial for etiological research on the psychopathies. Our ability to distinguish subtypes phenotypically suggests that it is worthwhile to pursue etiological research to advance understanding of variants. Both classic (Karpman, 1941) and recent (Mealey, 1995; Porter, 1996) theories distinguish variants chiefly on the basis of etiology: Primary psychopathy is conceptualized as chiefly attributable to a heritable affective deficit; secondary psychopathy is conceptualized as chiefly attributable to an acquired affective disturbance or adaptation.

Although etiological research on psychopathy is in its infancy, both environmental and genetic factors have been related to the disorder (for reviews, see Patrick et al., 1997; Skeem et al., 2003). First, studies consistently relate putative environmental factors such as parental rejection, neglect, and abuse with later antisocial behavior and psychopathy, as assessed by PCL measures (e.g., Forth & Burke, 1998; Margolin & Gordis, 2000; Marshall & Cooke, 1996; Poythress, Skeem, & Lilienfeld, 2006; Weiler & Widom, 1996). A study of 1,167 child twin pairs (Jaffe, Caspi, Moffit, & Taylor, 2004) suggested that such abuse plays a causal role in antisocial behavior rather than acting as a proxy for genetic influences that increase both the likelihood that parents will be abusive and that children will become antisocial. Second, in a study of 3,687 child twin pairs, Viding, Blair, Moffit, and Plomin (2005) found a substantial genetic risk ($h = 0.67$) for teachers' ratings of callous and unemotional traits: Concordance rates for identical and dizygotic twins were 73% and 39%, respectively. Although this study suggests a strong genetic risk for psychopathy, there was no significant difference in heritability estimates for antisocial twins who did and did not have these additional callous and unemotional traits. Moreover, the measure of these traits was unvalidated and may not tap "traits" that are stable across development (see Edens, Skeem, Cruise, & Cauffman, 2001).

Given their behavior–genetic designs, such studies hold promise for determining whether influences on psychopathy are genetic, environmental, or both. These studies would be more informative,

however, if they allowed for the possibility of variants of psychopathy rather than treating psychopaths as a homogeneous group (Skeem et al., 2003). To rule out etiologically distinct variants, investigators could include measures of both psychopathy and trait anxiety. Anxiety is a basic emotion that may have temperamental counterparts across developmental stages (Bernstein, Borchardt, & Perwien, 1996; Kagan, Reznick, & Gibbons, 1989; Kagan, Scnidman, & Perwien, 1996). If twin pairs were disaggregated on the basis of trait anxiety (or perhaps even social dominance vs. withdrawal), the results would be better able to speak to the issue of whether there are primary and secondary psychopathies with different genetic and environmental contributors. Ideally, such studies would include valid measures of environmental influences, genuinely assessing nature, nurture, and their interactions (for examples, see Jaffe et al., 2004; Tienari et al., 2004). The most compelling understanding of differences in etiologies for primary and secondary variants will come from elegant designs that fairly assess both aspects of this equation (Rutter, 2005).

It will also be helpful in etiological research to clarify the relation between the psychopathies and conceptually related disorders. For example, Krueger et al. (2002) used adult twin data to estimate genetic, shared environmental, and nonshared environmental contributors to both a latent "externalizing" factor that represented the shared variance among several disinhibitory disorders and traits and to factors that represented the unique variance of each phenotype (e.g., antisocial behavior, drug dependence, unconstrained personality). Given descriptive similarities between these externalizing disorders and secondary psychopathy, secondary psychopathy may be more tightly linked with this factor than primary psychopathy. This remains an open question for future research.

Reducing Violence and Other Negative Outcomes

A chief reason for studying etiological pathways toward the psychopathies is that "the way you understand a problem determines how you fix it" (Randall Borum, personal communication, April 16, 2003). Secondary psychopathy has long been conceptualized as a "psychosocially rooted" condition that is more amenable to traditional treatment than primary psychopathy. Although their affective capacities are disturbed, secondary psychopaths may be able to establish a therapeutic alliance and improve through psychotherapy (see Hovarth & Symonds, 1991; Krupnick et al., 1996). Indeed, such affective disturbances as anxiety, depression, and emotional instability are traditional treatment targets clinicians are trained to address. In contrast, primary psychopaths with affective deficits may require highly structured alternative approaches that focus not on instilling "affect (love) and morality (guilt) . . . [but on] modifying the cognitions and behaviors that directly precipitate . . . violent behavior" (Wong, 2000, p. 99). There would be an explicit focus on providing primary psychopaths with constructive outlets for meeting their goals (e.g., attaining wealth, avoiding boredom) in a socially acceptable manner that better served them. In short, treatment strategies may vary as a function of the type of psychopathy being targeted.

Although the field is far from such psychopathy treatment matching paradigms, there has been a rejuvenation of research on the basic relation between psychopathy and treatment outcomes. Despite entrenched views that "psychopaths cannot be treated" or

that "treatment makes psychopaths worse," such research indicates that individuals with pronounced psychopathic traits respond to sufficient doses of treatment by becoming less violent and antisocial (Caldwell, Skeem, Salekin, & Van Ryboek, in press; Salekin, 2001; Skeem, Monahan, & Mulvey, 2002). These effects may largely be attributable to the inclusion of secondary variants in psychopathic samples, but there have been no attempts to disaggregate psychopathy in these studies or to identify the features of more and less responsive variants. Such research is necessary, given indications that the broader class of antisocial personality disorder may be disaggregated into more and less treatment responsive types on the basis of the presence or absence of "psychoneurotic" symptoms (e.g., Gerstley, Alterman, McLellan, & Woody, 1990). The present study explored whether variants could be differentiated on the basis of their treatment responsiveness on a limited retrospective measure that made up a single HCR–20 item. Nevertheless, there was a trend ($p < .10$) toward secondary psychopaths being rated as more responsive to past treatment efforts than primary psychopaths. There is reason for some optimism, then, about successfully treating secondary psychopathy.

Future, prospective investigations of psychopathy variants' responses to treatment are needed. Such research other than that conducted to date could determine whether variants could be dissociated on the basis of their response to treatment. Such research has the potential for maximum return, given that individuals with psychopathy account for a disproportionate amount of violence and criminal recidivism (Salekin et al., 1996); have social, marital, educational, and vocational dysfunction (Cleckley, 1976); and generally behave irresponsibly. The development of effective interventions for primary, secondary, or both variants of violent, psychopathic offenders could reduce a range of negative outcomes for this high-risk group.

Of course, prevention of further violence is considered a goal of paramount importance. Although the present data cannot address the issue, it will be important to understand whether psychopathic variants differ in their typical pattern of violence. Future research may assess whether secondary psychopaths are disproportionately likely to engage in hostile, defensive, reactive aggression, whereas primary psychopaths tend toward more instrumental, appetitive, or proactive aggression (see Patrick & Zempolich, 1998; Skeem et al., 2003). Ideally, such research would distinguish between variants on the basis of their anxiety rather than their PCL–R profiles, as the latter reflect past violent behavior. Variants would be followed over time to assess their involvement in reactive versus instrumental violence (e.g., Cornell et al., 1996), with particular attention to the interpersonal function of aggression (see Benjamin, 2001). Violence predominantly may be used as a means of obtaining distance (secondary psychopathy: withdrawal) or control (primary psychopathy: dominance). Understanding the function of violence can inform variant-specific treatment strategies designed to prevent its recurrence (see Skeem & Mulvey, 2001).

References

Aldenderfer, M., & Blashfield, R. (1984). *Cluster analysis.* Beverly Hills, CA: Sage.

Alterman, A. I., McDermott, P. A., Cacciola, J. S., Rutherford, M. J., Boardman, C. R., McKay, J. R., & Cook, T. G. (1998). A typology of antisociality in methadone patients. *Journal of Abnormal Psychology, 107,* 412–422.

American Psychiatric Association. (1994). Diagnostic and statistical manual of mental disorders (4th ed.). Washington, DC: Author.

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.

Arnett, P. A., Smith, S. S., & Newman, J. P. (1997). Approach and avoidance motivation in psychopathic criminal offenders during passive avoidance. *Journal of Personality and Social Psychology, 72,* 1413–1428.

Banfield, J. D., & Raftery, A. E. (1993). Model-based Gaussian and non-Gaussian clustering. *Biometrics, 49,* 803–821.

Benjamin, L. S. (2001). Commentary on the suicidal risk in severe personality disorders: Differential diagnosis and treatment. *Journal of Personality Disorders, 15,* 209–211.

Bernstein, G. A., Borchardt, C. M., & Perwien, A. R. (1996). Anxiety disorders in children and adolescents: A review of the past 10 years. *Journal of the American Academy of Child and Adolescent Psychiatry, 35,* 1110–1119.

Blackburn, R. (1968). Personality in relation to extreme aggression in psychiatric offenders. *British Journal of Psychiatry, 114*, 821–828.

Blackburn, R. (1971). Personality types among abnormal homicides. *British Journal of Criminology, 11,* 14–31.

Blackburn, R. (1975). An empirical classification of psychopathic personality. *British Journal of Psychiatry, 127,* 456–460.

Blackburn, R. (1996). Psychopathy, delinquency and crime. In A. Gale & J. A. Edwards (Eds.), *Physiological correlates of human behavior: Vol 3. Individual differences and psychopathology* (pp. 187–205). Orlando, FL: Academic Press.

Blackburn, R. (1998a). Criminality and the interpersonal circle in mentally disordered offenders. *Criminal Justice and Behavior, 25,* 155–176.

Blackburn, R. (1998b). Psychopathy and personality disorder: Implications of interpersonal theory. In D. J. Cooke, A. E. Forth, & R. D. Hare (Eds.), *Psychopathy: Theory, research, and implications for society* (pp. 269–301). Dordrecht, the Netherlands: Kluwer.

Blackburn, R. (1999). Personality assessment in violent offenders: The development of the Antisocial Personality Questionnaire. *Psychologica Belgica, 39,* 87–111.

Blackburn, R., & Coid, J. (1999). Empirical clusters of *DSM–III* personality disorders in violent offenders. *Journal of Personality Disorders, 13,* 18–34.

Blackburn, R., & Lee-Evans, J. M. (1985). Reactions of primary and secondary psychopaths to anger-evoking situations. *British Journal of Clinical Psychology, 24,* 93–100.

Bodlund, O., Kullgren, G., Ekselius, L., Lindstron, E., & von Knorring, L. (1994). Axis V—Global Assessment of Functioning Scale: Evaluation of a self-report version. *Acta Psychiatrica Scandinavica, 9,* 342–347.

Caldwell, M., Skeem, J., Salekin, R., & Van Ryoboek, G. (2006). Treatment response of adolescent offenders with psychopathy features: A two-year follow-up. *Criminal Justice and Behavior, 33,* 571–596.

Cleckley, H. (1941). *The mask of sanity.* St. Louis, MO: Mosby.

Cleckley, H. (1976). *The mask of sanity* (5th ed.). St. Louis, MO: Mosby.

Cleckley, H. M. (1964). *The mask of sanity: An attempt to clarify some issues about the so-called psychopathic personality* (4th ed.). Saint Louis, MO: C. V. Mosby.

Cooke, D. J., & Michie, C. (2001). Refining the construct of psychopathy: Towards a hierarchical model. *Psychological Assessment, 13,* 171–188.

Cooke, D. J., Michie, C., Hart, S. D., & Clark, D. A. (2004). Reconstructing psychopathy: Clarifying the significance of antisocial and socially deviant behavior in the diagnosis of psychopathic personality disorder. *Journal of Personality Disorders, 18,* 337–356.

Cornell, D. G., Warren, J., Hawk, G., Stafford, E., Oram, G., & Pine, D. (1996). Psychopathy in instrumental and reactive violent offenders. *Journal of Consulting and Clinical Psychology, 64,* 783–790.

Douglas, K. S., & Weir, J. (2003). *HCR–20 violence risk assessment scheme: Overview and annotated bibliography.* Retrieved May 18, 2005, from http://chriswebster.violence-risk.com/hcr20annotated.pdf

Edens, J. F., Marcus, D. K., Lilienfeld, S. O., & Poythress, N. G. (2006). Psychopathic, not psychopath: Taxometric evidence for the dimensional structure of psychopathy. *Journal of Abnormal Psychology, 115,* 131–144.

Edens, J. F., Skeem, J. L., Cruise, K. R., & Cauffman, E. (2001). Assessment of "juvenile psychopathy" and its association with violence: A critical review. *Behavioral Sciences and the Law, 19,* 53–80.

Ekselius, L., Hetta, J., & von Knorring, L. (1994). Relationship between personality traits as determined by means of the Karolinska Scales of Personality (KSP) and personality disorders according to *DSM–III–R. Personality and Individual Differences, 16,* 589–595.

Forth, A., & Burke, H. (1998). Psychopathy in adolescence: Assessment, violence, and developmental precursors. In D. Cooke, A. Forth, & R. Hare (Eds.), *Psychopathy: Theory, research and implications for society* (pp. 205–299). The Netherlands: Kluwer Academic.

Fowles, D., & Missel, K. (1994). Electrodermal hyporeactivity, motivation, and psychopathy: Theoretical issues. In D. Fowles, P. Sutker, & S. Goodman (Eds.), *Progress in experimental personality and psychopathology research 1994: Special focus on psychopathy and antisocial behavior: A developmental perspective* (pp. 263–283). New York: Springer.

Fraley, C., & Raftery, A. E. (2002). mclust: Software for model-based clustering, density estimation and discriminant analysis (Tech. Rep, No. 415). Department of Statistics, University of Washington.

Frick, P. J., Lilienfeld, S. O., Edens, J. F., Poythress, N. G., Ellis, M., & McBurnett, K. (2000). The association between anxiety and antisocial behavior. *Primary Psychiatry, 7,* 52–57.

Gerstley, L. J., Alterman, A. I., McLellan, A. T., & Woody, G. E. (1990). Antisocial personality disorder in substance abusers: A problematic diagnosis? *American Journal of Psychiatry, 147,* 173–178.

Gray, J. A. (1987). *The psychology of fear and stress* (2nd ed.). Cambridge, England: Cambridge University Press.

Gustavsson, P., Weinryb, R. M., Göransson, S., Pedersen, N. L., & Åsberg, M. (1997). Stability and predictive ability of personality traits across 9 years. *Personality and Individual Differences, 22,* 784–791.

Haapasalo, J., & Pulkkinen, L. (1992). The Psychopathy Checklist and nonviolent offender groups. *Criminal Behaviour and Mental Health, 2,* 315–328.

Hall, J. R., Benning, S. D., & Patrick, C. J. (2004). Criterion-related validity of the three-factor model of psychopathy: Personality, behavior, and adaptive functioning. *Assessment, 11,* 4–16.

Hare, R. D. (1991). *Manual for the Revised Psychopathy Checklist.* Toronto, Ontario, Canada: Multi-Health Systems.

Hare, R. D. (2003). *The Hare Psychopathy Checklist—Revised manual* (2nd ed.). Toronto, Ontario, Canada: Multi-Health Systems.

Hare, R. D., Clark, D., Grann, M., & Thornton, D. (2000). Psychopathy and the predictive validity of the PCL–R: An international perspective. *Behavioral Sciences and the Law, 18,* 623–645.

Harpur, T. J., Hare, R. D., & Hakstian, A. R. (1989). Two-factor conceptualization of psychopathy: Construct validity and assessment implications. *Psychological Assessment: A Journal of Consulting and Clinical Psychology, 1,* 6–17.

Hart, S. D., & Hare, R. D. (1989). Discriminant validity of the Psychopathy Checklist in a forensic psychiatric population. *Psychological Assessment: A Journal of Consulting and Clinical Psychology, 1,* 211–218.

Hart, S. D., & Hare, R. D. (1997). The association between psychopathy and narcissism: Theoretical views and empirical evidence. In E. Ronningstam (Ed.), *Disorders of narcissism—Theoretical, empirical, and clinical implications* (pp. 415–436). Washington, DC: American Psychiatric Press.

Hemphill, J. F., Templeman, R., Wong, S., & Hare, R. D. (1998). Psychopathy and crime: Recidivism and criminal careers. In D. J. Cooke,

A. E. Forth, & R. D. Hare (Eds.), *Psychopathy: Theory, research, and implications for society* (pp. 375–399). Dordrecht, the Netherlands: Kluwer.

Hervé, H., Yong Hui Ling, J., & Hare, R. D. (2000, March). *Criminal psychopathy and its subtypes.* Paper presented at the American Psychology–Law Society conference, New Orleans.

Hiatt, K. D., Lorenz, A. R., & Newman, J. P. (2002). Assessment of emotion and language processing in psychopathic offenders: Results from a dichotic listening task. *Personality and Individual Differences, 32,* 1255–1268.

Hicks, B., Markon, K, Patrick, C., Krueger, R., & Newman, J. (2004). Identifying psychopathy subtypes on the basis of personality structure. *Psychological Assessment, 16,* 276–288.

Hovarth, A., & Symonds, B. (1991). The role of the therapeutic alliance in psychotherapy. *Journal of Consulting and Clinical Psychology, 38,* 139–149.

Jaffee, S., Caspi, A., Moffitt, T., & Taylor, A. (2004). Physical maltreatment victim to antisocial child: Evidence of an environmentally mediated process. *Journal of Abnormal Psychology, 113,* 44–55.

Kagan, J., Reznick, J. S., & Gibbons, J. (1989). Inhibited and uninhibited types of children. *Child Development, 60,* 838–845.

Kagan, J., Snidman, N., Arcus, D. (1998). Childhood derivatives of high and low reactivity in infancy. *Child Development, 69,* 1483–1493.

Karpman, B. (1941). On the need of separating psychopathy into two distinct clinical types: The symptomatic and the idiopathic. *Journal of Criminology and Psychopathology, 3,* 112–137.

Karpman, B. (1948). Conscience in the psychopath: Another version. *American Journal of Orthopsychiatry, 18,* 455–491.

Klinteberg, B., Humble, K., & Schalling, D. (1992). Personality and psychopathy of males with a history of early criminal behavior. *European Journal of Personality, 6,* 245–320.

Kosson, D., & Newman, J. (1995). An evaluation of Mealey's hypotheses based on Psychopathy Checklist-identified groups. *Behavioral and Brain Sciences, 18,* 562–563.

Krueger, R. F., Hicks, B. M., Patrick, C. J., Carlson, S. R., Iacono, W. G., & McGue, M. (2002). Etiologic connections among substance dependence, antisocial behavior and personality: Modeling the externalizing spectrum. *Journal of Abnormal Psychology, 111,* 411–424.

Krupnick, J., Sotsky, S. M., Simmens, S., Moyer, J., Elkin, I., Watkins, J., & Pilkonis, P. A. (1996). The role of the therapeutic alliance in psychotherapy and pharmacotherapy outcome: Findings in the National Institute of Mental Health Treatment of Depression Collaborative Research Program. *Journal of Consulting and Clinical Psychology, 64,* 532–539.

Levenson, M. R. (1995). Physio-sociology or psychology of conscience? Reply to Smith. *Theory and Psychology, 5,* 139–144.

Levenson, M. R., Kiehl, K. A., & Fitzpatrick, C. M. (1995). Assessing psychopathic attributes in a noninstitutional population. *Journal of Personality and Social Psychology, 68,* 151–158.

Lorenz, A. R., & Newman, J. P. (2002). Deficient response modulation and emotion processing in low-anxious Caucasian psychopathic offenders: Results from a lexical decision task. *Emotion, 2,* 91–104.

Lykken, D. T. (1995). *The antisocial personalities.* Hillsdale, NJ: Erlbaum.

Margolin, G., & Gordis, E. (2000). The effects of family and community violence on children. *Annual Review of Psychology, 51,* 445–479.

Marshall, L., & Cooke, D. J. (1996). The role of childhood experiences in the aetiology of psychopathy. In D. J. Cooke, A. E. Forth, J. P. Newman, & R. D. Hare (Eds.), *Issues in criminological and legal psychology: No. 24. International perspectives on psychopathy* (pp. 107–108). Leicester, England: British Psychological Society.

McCord, W., & McCord, J. (1964). *The psychopath: An essay on the criminal mind.* Princeton, NJ: Van Nostrand.

Mealey, L. (1995). The sociobiology of sociopathy: An integrated evolutionary model. *Behavioral and Brain Sciences, 18,* 523–540.

Morrison, D., & Gilbert, P. (2001). Social rank, shame and anger in primary and secondary psychopaths. *Journal of Forensic Psychiatry, 12,* 330–356.

Neumann, C. S., Vitacco, M. J., Hare, R. D., & Wupperman, P. (in press). Reconstructing the "reconstruction" of psychopathy: A comment on Cooke, Michie, Hart, & Clark. *Journal of Personality Disorders.*

Newman, J. P., MacCoon, D. G., Vaughn, L. J., & Sadeh, N. (2005). Validating a distinction between primary and secondary psychopathy with measures of Gray's BIS and BAS constructs. *Journal of Abnormal Psychology, 114,* 319–323.

Newman, J. P., & Schmitt, W. (1998). Passive avoidance in psychopathic offenders: A replication and extension. *Journal of Abnormal Psychology, 107,* 527–532.

Newman, J. P., Schmitt, W., & Voss, W. (1997). The impact of motivationally neutral cues on psychopathic individuals: Assessing the generality of the response modulation hypothesis. *Journal of Abnormal Psychology, 106,* 563–575.

Ottosson, H., Bodlund, O., Ekselius., von Knorring, L., Kullgren, G., Lindström, E., & Söderberg, S. (1995). The *DSM–IV* and *ICD–10* personality questionnaire (DIP-Q). Construction and preliminary validation. *Nordic Journal of Psychiatry, 49,* 285–292.

Patrick, C. J., & Zempolich, K. A. (1998). Emotion and aggression in the psychopathic personality. *Aggression and Violent Behavior, 3,* 303–338.

Patrick, C. J., Zempolich, K. A., & Levenston, G. K. (1997). Emotionality and violent behavior in psychopaths: A biosocial analysis. In A. Raine & P. A. Brennan (Eds.), *Biosocial bases of violence* (pp. 145–161). New York: Plenum Press.

Porter, S. (1996). Without conscience or without active conscience? The etiology of psychopathy revisited. *Aggression and Violent Behavior, 1,* 1–11.

Poythress, N., Edens, J., Lilienfeld, S., & Skeem, J. (2001). *Personality deviancy and antisocial behavior.* Unpublished grant proposal.

Poythress, N., & Skeem, J. (2006). Disaggregating psychopathy: Where and how to look for variants. In C. Patrick (Ed.), *Handbook of psychopathy* (pp. 172–192). New York: Guilford Press.

Poythress, N., Skeem, J., & Lilienfeld, S. (2006). Associations among early abuse, dissociation, and psychopathy among offenders. *Journal of Abnormal Psychology, 115,* 288–297.

Raftery, A. E. (1995). Bayesian model selection in social research. *Sociological Methodology, 25,* 111–163.

Rutherford, M. J., Alterman, A. I., Cacciola, J. S., & McKay, J. R. (1997). Validity of the Psychopathy Checklist—Revised in male methadone patients. *Drug and Alcohol Dependence, 44,* 143–149.

Rutter, M. (2005). Environmentally mediated risk for psychopathology: Research strategies and findings. *Journal of the American Academy of Child & Adolescent Psychiatry, 44,* 3–18.

Salekin, R. (2001, August). *Psychopathy and modern pessimism: A need for a modern view.* Invited address given at the annual meeting of the American Psychological Association, San Francisco.

Salekin, R., Rogers, R., & Sewell, K. (1996). A review and meta-analysis of the Psychopathy Checklist and Psychopathy Checklist—Revised: Predictive validity of dangerousness. *Clinical Psychology: Science and Practice, 3,* 203–215.

Salekin, R., Rogers, R., Ustad, K. L., & Sewell, K. (1998). Psychopathy and recidivism among female inmates. *Law and Human Behavior, 22,* 109–128.

Schmitt, W., & Newman, J. (1999). Are all psychopathic individuals low-anxious? *Journal of Abnormal Psychology, 108,* 353–358.

Shadish, W. R. (1995). The logic of generalization: Five principles common to experiments and ethnographies. *American Journal of Community Psychology, 23,* 419–429.

Shine, J. H., & Hobson, J. A. (1997). Construct validity of the Hare Psychopathy Checklist, Revised, on a UK prison population. *Journal of Forensic Psychiatry, 8,* 546–561.

Skeem, J. L., Monahan, J., & Mulvey, E. P. (2002). Psychopathy, treatment

involvement, and subsequent violence among civil psychiatric patients. *Law and Human Behavior, 26,* 577–603.

Skeem, J., & Mulvey, E. (2001). Psychopathy and community violence among civil psychiatric patients: Results from the MacArthur Violence Risk Assessment Study. *Journal of Consulting and Clinical Psychology, 69,* 358–374.

Skeem, J. L., Poythress, N., Edens, J. F., Lilienfeld, S. O., & Cale, E. M. (2003). Psychopathic personality or personalities? Exploring potential variants of psychopathy and their implications for risk assessment. *Aggression and Violent Behavior, 8,* 513–546.

Sutton, S. K., Vitale, J. E., & Newman, J. P. (2002). Emotion among women with psychopathy during picture perception. *Journal of Abnormal Psychology, 111,* 610–619.

Swedish Prison and Probation Services. *Statistics.* (2003). Retrieved January 21, 2005, from http://www.kvv.se

Tienari, P., Wynne, L. C., Sorri A., Lahti, I., Läksy, K., Moring, J., et al. (2004). Genotype–environment interaction in schizophrenia-spectrum disorder. Long-term follow-up study of Finnish adoptees. *British Journal of Psychiatry, 184,* 216–222.

Tonindel, S., & Overall, J. E. (2004). Determining the number of clusters by sampling with replacement. *Psychological Methods, 9,* 238–249.

Vassileva, J., Kosson, D. S., Abramowitz, C., & Conrod, P. (2005). Psychopathy versus psychopathies in classifying criminal offenders. *Legal and Criminological Psychology, 10,* 27–43.

Verona, E., Patrick, C. J., & Joiner, T. T. (2001). Psychopathy, antisocial personality, and suicide risk. *Journal of Abnormal Psychology, 110,* 462–470.

Viding, E., Blair, R. J. R., Moffitt, T. E., & Plomin, R. (2005). Evidence for substantial genetic risk for psychopathy in 7-year-olds. *Journal of Child Psychology and Psychiatry, 46,* 592–597.

Webster, C. D., Douglas, K. S., Eaves, D., & Hart, S. D. (1997). Assessing risk of violence to others. In C. D. Webster & M. A. Jackson (Eds.), *Impulsivity: Theory, assessment, and treatment* (pp. 251–277). New York: Guilford Press.

Weiler, B. L., & Widom, C. S. (1996). Psychopathy and violent behaviour in abused and neglected young adults. *Criminal Behaviour and Mental Health, 6,* 253–271.

Wong, S. (2000). Psychopathic offenders. In S. Hodgins & R. Muller-Isberner (Eds.), *Violence, crime and mentally disordered offenders: Concepts and methods for effective treatment* (pp. 87–112). London: Wiley.

Woodworth, M., & Porter, S. (2002). In cold blood: Characteristics of criminal homicides as a function of psychopathy. *Journal of Abnormal Psychology, 111,* 436–445.

World Health Organization. (1992). *International classification of diseases* (10th ed.). Geneva, Switzerland: Author.

Correction to Skeem et al. (2007)

In the article "Two Subtypes of Psychopathic Violent Offenders That Parallel Primary and Secondary Variants," by Jennifer Skeem, Peter Johansson, Henrik Andershed, Margaret Kerr, and Jennifer Eno Louden (*Journal of Abnormal Psychology,* 2007, Vol. 116, No. 2, pp. 395–409), the headings "Primary ($n = 74$)" and "Secondary ($n = 49$)" should be reversed in Table 1 on p. 401. In addition, the means for the Psychic Anxiety scale of the Karolinska Scales of Personality should be 0.52 (rather than −0.52) and −0.34 (rather than 0.34).