

Effects of Comorbid Psychopathy on Criminal Offending and Emotion Processing in Male Offenders With Antisocial Personality Disorder

David S. Kosson

Rosalind Franklin University of Medicine and Science

Amanda R. Lorenz and Joseph P. Newman

University of Wisconsin—Madison

Antisocial personality disorder (ASPD) and psychopathy are two syndromes with substantial construct validity. To clarify relations between these syndromes, the authors evaluated 3 possibilities: (a) that ASPD with psychopathy and ASPD without psychopathy reflect a common underlying pathophysiology; (b) that ASPD with psychopathy and ASPD without psychopathy identify 2 distinct syndromes, similar in some respects; and (c) that most correlates of ASPD reflect its comorbidity with psychopathy. Participants were 472 incarcerated European American men who met *Diagnostic and Statistical Manual* (4th ed., American Psychiatric Association, 1994) criteria for ASPD and Psychopathy Checklist criteria for psychopathy, who met the criteria for ASPD but not for psychopathy, or who did not meet diagnostic criteria for either ASPD or psychopathy (controls). Both individuals with ASPD only and those with ASPD and psychopathy were characterized by more criminal activity than were controls. In addition, ASPD with psychopathy was associated with more severe criminal behavior and weaker emotion facilitation than ASPD alone. Group differences in the association between emotion dysfunction and criminal behavior suggest tentatively that ASPD with and ASPD without prominent psychopathic features may be distinct syndromes.

Keywords: psychopathy, antisocial personality disorder, classification, comorbidity

Since publication of the third edition of the *Diagnostic and Statistical Manual of Mental Disorders (DSM-III;* American Psychiatric Association, 1980), the relationship between antisocial personality disorder (ASPD) and psychopathy has been controversial (Hare, Hart, & Harpur, 1991). Whereas the *DSM-IV* (American Psychiatric Association, 1994) reports that these two diagnostic categories describe similar patterns of long-standing antisocial behavior, several authors have argued that in the operationalization of ASPD, *DSM-III* and its revisions sacrifice validity in the service of reliability (Kernberg, 1989; Lilienfeld, 1994; Millon, 1981) or are too nonspecific, at least for use within correctional settings (MacKay, 1986; Widiger et al., 1996). Indeed, *DSM-IV* refers explicitly to the possibility that features of psychopathy “may be particularly distinguishing of Antisocial Personality Disorder in prison or forensic settings” (p. 647). Such statements imply that the combination of ASPD and psychopathy may be particularly important within prisons. However, no accepted assessment of ASPD includes this step, and no prior studies have examined whether the categorical assessment of ASPD is affected by the

assessment of comorbid psychopathic features (see also Hare, 1996).

It is unquestionable that the category of ASPD has amassed considerable construct validity. ASPD diagnoses have been correlated with abuse of controlled substances (Skodol, Oldham, & Gallaher, 1999), psychophysiological anomalies (Raine, Lencz, Bihrlé, LaCasse, & Colletti, 2000), and neuropsychological deficits (Gillen & Hesselbrock, 1992; Stevens, Kaplan, & Hesselbrock, 2003). Further, ASPD diagnoses predict treatment failure (Kranzler, Del Boca, & Rounsaville, 1996) and recidivism (Harris, Rice, & Cormier, 1991).

Similarly, the psychopathy syndrome as operationalized by the Psychopathy Checklist—Revised (PCL—R; Hare, 1991) has attained a considerable degree of convergent and discriminant validation. In fact, psychopathy predicts many of the same negative outcomes as ASPD, including treatment failure (Hobson, Shine, & Roberts, 2000; Reiss, Grubin, & Meux, 1999), involvement in violent and nonviolent offenses (Hare & McPherson, 1984), recidivism (Harris et al., 1991; Hemphill, Templeman, Wong, & Hare, 1998), and substance abuse or dependence (Hart & Hare, 1989; Smith & Newman, 1990). Not only do psychopathic inmates display prolific criminal behavior, but they also are characterized by substantial versatility in the kinds of antisocial behavior they carry out (Brinkley, Schmitt, Smith, & Newman, 2001; Kosson, Smith, & Newman, 1990).

Because most individuals who meet diagnostic criteria for ASPD do not meet current criteria for psychopathy (Hare, 2003), the many parallels between the ASPD and psychopathy literatures suggest the possibility that ASPD (with or without psychopathy) and psychopathy reflect the same pathological genetic/biological and developmental processes. According to this view, contemporary diagnostic criteria for ASPD and psychopathy may differ in

David S. Kosson, Department of Psychology, Rosalind Franklin University of Medicine and Science; Amanda R. Lorenz and Joseph P. Newman, Department of Psychology, University of Wisconsin—Madison.

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Correspondence concerning this article should be addressed to David S. Kosson, Department of Psychology, Rosalind Franklin University of Medicine and Science, 3333 Green Bay Road, North Chicago, IL 60064. E-mail: david.kosson@rosalindfranklin.edu

sensitivity, specificity, and reliability, but they reflect different methods of assessing the same underlying syndrome (e.g., American Psychiatric Association, 1994; see also Widiger et al., 1996, for a comparison of the reliability and concurrent validity of ASPD and PCL-R–based criterion sets). For example, the greater number of items and higher cutoffs for PCL-R psychopathy than for *DSM* ASPD may result in more accurate diagnosis, but the pathophysiology of the underlying disorder may be the same.¹

In contrast, it could be argued that there are important differences in the underlying mechanisms associated with ASPD versus psychopathy. For example, Lykken (1995) proposed that psychopathic personalities represent an etiologically distinct subgroup within the family of antisocial personalities and suggested that the majority of individuals with ASPD are not psychopathic. Consistent with this perspective, several researchers have argued that psychopaths are characterized by a pattern of emotional and, in some cases, cognitive deficits that do not distinguish inmates with ASPD from those without ASPD (Harpur, Hare, & Hakstian, 1989; Patrick, 1994). Further, recent evidence indicates that psychopathy explains variance in hippocampal volume even among individuals with ASPD (Laakso et al., 2001). Conversely, individuals with ASPD display cardiovascular anomalies (Raine et al., 2000) that are not associated with psychopathy (Raine, 1997). Similarly, ASPD and life-course persistent offenders have been reported to exhibit neuropsychological deficits (Moffitt, 1993; Stevens, Kaplan, & Bauer, 2001; Stevens et al., 2003) that are not seen in psychopathic offenders (Hare, Hart, & Forth, 1990; Smith, Arnett, & Newman, 1992). Because most psychopathic offenders meet diagnostic criteria for ASPD but most ASPD offenders do not meet diagnostic criteria for psychopathy, findings such as these raise the possibility that ASPD is heterogeneous and that the syndrome of ASPD plus psychopathy is essentially distinct from the syndrome of ASPD without psychopathy (cf. Hare, 1999).²

Because psychopathy appears superior to ASPD in predicting some outcomes such as recidivism and treatment failure (Cunningham & Reidy, 1998; Hare et al., 1991; Hobson et al., 2000), it is also important to consider whether much of the predictive value of ASPD reflects its high comorbidity with psychopathy. According to this perspective, ASPD has predictive utility primarily because a substantial minority of individuals diagnosed with ASPD are also psychopathic. Accordingly, removing the subset of psychopaths from larger samples of ASPD individuals would be expected to reduce or eliminate associations between ASPD and the kinds of criteria of interest to criminologists and mental health professionals. Although identifying large numbers of offenders who are psychopathic but non-ASPD is generally not possible, one could examine whether previously reported relationships between ASPD and other constructs are related to the common practice of including psychopaths in ASPD groups simply by comparing individuals with ASPD and psychopathy versus individuals with ASPD but not psychopathy.³ However, no prior studies of these two disorders have separated individuals with ASPD and psychopathy from those with ASPD alone.

The purpose of the present study was to evaluate three perspectives. By examining whether individuals with both ASPD and psychopathy versus those with ASPD without psychopathy exhibit similar or different performance on real-world and laboratory indexes prominent in the psychopathy literature, we investigated three possibilities: (a) that ASPD with psychopathy and ASPD

without psychopathy appear to reflect the same underlying pathophysiology, (b) that they reflect two distinct patterns of underlying mechanisms, and (c) that the predictive value of ASPD reflects its high comorbidity with psychopathy. We chose to examine both criminal behavior and emotional processing because these are two of the most extensively validated domains in the nomological network surrounding the psychopathy construct. Moreover, they are sufficiently distinct that, in the absence of theoretical constructs, one would not expect to see relationships in one domain generalize to the other. Because both ASPD and psychopathy are antisocial syndromes, both are expected to be associated with criminal activity. Thus, if the two disorders reflect the same underlying pathophysiology, then individuals with both ASPD and psychopathy versus those with ASPD alone may be expected to manifest relatively similar propensities in the domains of both crime and emotion processing. However, because the ASPD diagnosis requires criminal behavior, evidence for similarity in a laboratory index of affective pathology would constitute especially persuasive evidence for similar underlying mechanisms. Alternatively, if ASPD and psychopathy are distinct syndromes of antisocial behavior, then a different pattern of performance anomalies would be expected. For instance, analyses may reveal different patterns of deficits on a laboratory measure of emotional function and different patterns of relationships between laboratory performance and real-world criminal behavior. Third, if the validity of ASPD largely reflects its overlap with psychopathy, then the segregation of psychopaths from the remainder of the ASPD group should substantially reduce or eliminate typical associations between ASPD and maladaptive behavior.

To provide simultaneous tests of these three hypotheses, we carefully assessed male samples of inmates for both ASPD and psychopathy. ASPD diagnoses were based on the methods outlined in the *DSM-IV*. Psychopathy diagnoses were made according to procedures outlined in the manual for the PCL-R (Hare, 1991). Because there have also been controversies in the psychopathy literature about the validity of the psychopathy diagnosis among African American inmates (Kosson et al., 1990; Lorenz & New-

¹ We are indebted to Scott Lilienfeld for pointing out that the asymmetry in the percentages of offenders with psychopathy who meet criteria for ASPD as opposed to the converse may be attributable largely or entirely to base rates, because there are considerably higher rates of ASPD than of psychopathy in prison populations. It is entirely possible that this asymmetry may not extend to nonprison (e.g., community, psychiatric) samples.

² Our recognition of the possibility that ASPD with psychopathy and ASPD without psychopathy are partially distinct syndromes should not be construed as a suggestion that they should be listed as separate disorders in the *DSM*. As noted above, there is ample evidence that these syndromes overlap to a great extent. Moreover, as discussed by others, the high frequency of co-occurring personality disorders and symptoms in general has resulted in obstacles to understanding and treating the personality disorders (Lilienfeld, Waldman, & Israel, 1994). We are grateful to Tom Widiger for raising this issue.

³ The difficulty of identifying individuals with psychopathy but not ASPD may not extend to noninstitutionalized settings. Unfortunately, there have been very few studies of psychopathy using clinical measures outside forensic settings (but see Ishikawa, Raine, Lencz, Bihrlé, & Lacasse, 2001).

man, 2002b), analyses conducted for this study were limited to the available sample of European American male inmates.

To address these issues comprehensively, we conducted several types of analyses. First, we directly compared groups of inmates characterized by (a) ASPD plus psychopathy (ASPD + PSY), (b) ASPD but not psychopathy (ASPD-only), and (c) neither ASPD nor psychopathy (controls) on their antisocial behavior and emotional processing performance. We chose to compare these groups on both indexes of antisocial behavior and on emotional processing because these have been domains of central interest in the psychopathy literature. Because it could be argued that inmates with ASPD and psychopathy differ from inmates with ASPD but not psychopathy simply because PCL-R cutting scores for psychopathy groups require that individuals meet a higher percentage of criteria (30 of 40 points or 75% of maximum criteria) than do *DSM-IV* cutting scores for ASPD (3 of 7 adult criteria or 43% of maximum criteria), we also conducted supplementary analyses in which comparable cutting scores were used for both groups.⁴

Method

Participants

Four hundred and seventy-two men participated in this study. All participants were European American men between the ages of 18 and 45 years who were incarcerated in a state prison in southern Wisconsin at the time of the study. Men were excluded if they showed evidence of thought disorder, were taking psychotropic medication, performed below the fourth-grade level on achievement tests, or had estimated IQs below 70. Men were contacted by the researchers, provided with information about the purposes of the study, and asked to indicate their consent for participation in writing. Those who agreed to participate were interviewed and invited back to complete one or more laboratory tasks. To ensure that analysis procedures were consistent with previous studies of lexical decision (Steuerwald & Kosson, 2000; Williamson, Harpur, & Hare, 1991), we retained only data for right-handed men for this task. Of those meeting inclusion criteria, 88 men completed the affective lexical decision task (described below). Each inmate was administered a semistructured interview addressing his family, school, work, sexual, and criminal history. In addition, each inmate's prison record was examined as a source of collateral information. The combination of interview and file information was used to diagnose both psychopathy and ASPD.

Classification Measures

For the diagnosis of ASPD, we wrote interview questions to obtain answers to each of the *DSM-IV* criteria. The *DSM-IV* criteria require not only the presence of adult antisocial behavior in multiple domains but also the presence of conduct disorder prior to age 15 and evidence of antisocial behavior not attributable to schizophrenia or limited to manic episodes. Interrater agreement based on observed interviews ($n = 107$) was good, $\kappa = .92$.

The PCL-R (Hare, 1991) consists of 20 items, each referring to a behavioral disposition or trait that is characteristic of the adult psychopath. Each item is scored 0, 1, or 2 to denote whether the behavior disposition is *not at all present*, *present to some degree*, or *definitely present*. In the framework based on recommendations of Hare (1991), inmates who receive scores of 30 or higher are commonly considered to be psychopaths and inmates with scores of 20 or lower are commonly considered to be nonpsychopaths. The diagnostic status of inmates with scores greater than 20 but less than 30 is somewhat ambiguous, and such inmates are commonly referred to as a middle or intermediate group. Interrater agreement for PCL-R scores (based on observed interviews, with file reviews and

ratings conducted independently; $n = 108$) was good, average intraclass $r = .94$. In analyses addressing criminal behavior, PCL-R scores were modified: Scores on two items directly related to criminal conduct (juvenile delinquency and criminal versatility) were deleted, and scores were prorated. This procedure was used to reduce overlap between the measure of psychopathy and the measures of antisocial behavior; similar procedures have been used in other studies (Brinkley et al., 2001; Kosson et al., 1990; Vitale, Smith, Brinkley, & Newman, 2002).

For the purposes of this study, the inmates were divided into three groups. Individuals with ASPD plus psychopathy (ASPD + PSY) were 69 men who met all inclusion and exclusion criteria for ASPD and who met PCL-R criteria for psychopathy (i.e., PCL-R scores of ≥ 30). A second group consisted of 217 men with ASPD but not psychopathy (ASPD-only). These individuals met all inclusion and exclusion criteria for ASPD and had PCL-R scores of less than 30. The final group was 186 men with neither psychopathy nor ASPD (controls). This group included men with PCL-R scores below 30 who failed to meet diagnostic criteria for ASPD.

Criminal History Measures

We examined three indexes of criminal activity to address three different aspects of relationships between study groups and criminal conduct that have been investigated in prior studies: the number of charges for violent offenses, the number of charges for nonviolent offenses, and the number of different types of offenses.

Number of charges for violent and nonviolent offenses. On the basis of definitions used in prior studies (Hare & McPherson, 1984; Kosson et al., 1990), the following offenses were considered violent: robberies, murders, assaults, sexual assaults, kidnappings, and weapons offenses. Offenses considered nonviolent included burglaries and thefts, frauds and forgeries, drug offenses, negligence and major driving offenses, escapes, arsons, obstructions of justice, and miscellaneous minor offenses. The numbers of charges for violent and nonviolent offenses were tallied for each inmate.

Criminal versatility. The number of different categories in which inmates were charged with offenses was also calculated. This total provided an index of the versatility of each participant's criminal activities.

Laboratory Measure of Emotional Processing

On each of 192 trials, participants were presented with a pronounceable string of letters and asked to indicate by pressing one of two keys on the keyboard whether the string constituted an English word. The stimulus list included 48 words and 48 nonwords. The words were evenly divided into two groups: 24 were considered neutral, and 24 were affective (Rubin & Friendly, 1986). Affective and neutral words were matched on concreteness, frequency, imageability, pronounceability, and number of letters and syllables (see Lorenz & Newman, 2002b, for further detail). Nonwords closely resembled words, typically differing in two letters.

Past research shows that nonclinical samples are faster to classify affective words than neutral words, a phenomenon referred to as *affective*

⁴ Because factor analyses have suggested that several distinct (although correlated) dimensions underlie PCL-R scores (e.g., Cooke & Michie, 2001; Harpur et al., 1989), it could be argued that the PCL-R factors should be used to examine relationships between ASPD + PSY versus ASPD-only groups. However, the authors of these same studies argued forcefully that the PCL or PCL-R was homogeneous and that the existence of factors should not be interpreted as an argument against the use of psychopathy as a whole (see Hare, 2003; Harpur et al., 1989; see also Cooke, Kosson, & Michie, 2001). For example, Cooke and Michie (2001) reported that an analysis of general factor saturation (GFS) "indicated that the superordinate factor in this model is essentially a coherent construct explaining more than three quarters of the variance accounted for by the model" (p. 178).

facilitation. However, in prior studies, psychopathic individuals have exhibited significantly less affective facilitation than controls on lexical decision tasks (Steuerwald & Kosson, 2000; Williamson et al., 1991). Lorenz and Newman (2002b) reported that psychopaths exhibited a lack of affective facilitation when responding with the right hand but not when responding with the left hand, a finding interpreted as consistent with the left hemisphere activation hypothesis (Kosson, 1998) and with evidence that many of psychopaths' cognitive deficits are observed mainly under conditions designed to place greater demands on left hemisphere than on right hemisphere resources (Bernstein, Newman, Wallace, & Luh, 2000; Kosson, 1996, 1998; Llanes & Kosson, 2006; Suchy & Kosson, 2005). Because prior studies had also used only right-handed responses for this task (Steuerwald & Kosson, 2000; Williamson et al., 1991), we used only right-handed response data in the present analyses.

Results

Overview of Analyses

For each domain of analysis, preliminary analyses identified as outliers those values within each of the three inmate groups (control, ASPD-only, or ASPD + PSY) that differed from group means by more than three standard deviations. Of 472 inmates with complete information on classification and antisocial behavior measures, 3 ASPD + PSY, 4 ASPD-only, and 7 control inmates were identified as univariate outliers, and 1 ASPD-only inmate and 1 control inmate were identified as multivariate outliers; their exclusion left 66 ASPD + PSY inmates, 212 ASPD-only inmates, and 178 control inmates for analyses. Of the 88 inmates who completed the emotional processing task and who could be classified as belonging to one of these three groups, 1 outlier (1 control inmate) was identified. After he was eliminated from analyses, 25 ASPD + PSY inmates, 26 ASPD-only inmates, and 36 control inmates remained for emotional processing analyses. Then, for each domain, an analysis of variance (ANOVA) was performed, in which inmate group (control, ASPD-only, or ASPD + PSY) served as the between-subjects variable. Levene's (1960) test for homogeneity of variance was examined for each analysis; where there was evidence for heterogeneity of variance, the Welch F' and t' tests were used in ANOVAs and in tests comparing group means.

To examine real-world behavior, we performed ANOVAs to examine the number of different kinds of criminal offenses with which an individual was charged and the number of charges he received for nonviolent and for violent offenses (as defined above). To examine emotional processing, we used ANOVAs to determine the amount of emotion facilitation in the lexical decision task. The magnitude of facilitation was computed as the difference between the mean response latency to affective words and the mean response latency to neutral words. Although this task was completed with both the right hand and the left hand (in separate blocks), Lorenz and Newman (2002b) reported that psychopathic offenders exhibited emotional deficits only when using the right hand. Therefore, analyses were limited to trial blocks involving right-handed responses. Finally, regressions were conducted to examine relationships between emotional processing and crime for participants with ASPD alone versus those with ASPD + PSY.

Relationships Between Diagnosis and Antisocial Behavior

Criminal versatility. The ANOVA revealed group differences in the number of different offense categories in which charges had been registered, $F(2, 453) = 51.40, p < .001$. Both ASPD + PSY inmates and ASPD-only inmates committed more types of crimes than did controls: $t(242) = 9.87, p < .001, d = 1.27$, for ASPD + PSY inmates versus controls, and $t(388) = 6.65, p < .001, d = 0.68$, for ASPD-only inmates versus controls. In addition, ASPD + PSY inmates committed more types of crimes than ASPD-only inmates, $t(276) = 4.94, p < .001, d = 0.59$.

Charges for violent offenses. The groups also differed in charges for violent offenses, $F'(2, 160) = 17.76, p < .001$. ASPD + PSY offenders were charged with more violent offenses than were controls, $t'(79) = 5.50, p < .001, d = 1.24$, and with more violent offenses than ASPD-only inmates, $t'(80) = 3.95, p < .001, d = 0.88$. The difference between ASPD-only and control inmates was also significant, $t'(386) = 3.48, p = .001, d = 0.35$ (see Table 1).

Charges for nonviolent offenses. The ANOVA revealed main effects for group, $F'(2, 172) = 31.58, p < .001$. As shown in Table 1, comparisons examining group differences revealed that all three groups differed in the number of charges for nonviolent offenses:

Table 1
Group Means and Standard Deviations for Criminal Conduct and for Affective Facilitation of Lexical Decision

Variable	Group					
	Control		ASPD-only		ASPD + PSY	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
No. of charges for violent offenses	1.98 _a	2.25	2.82 _b	2.50	4.97 _c	4.20
No. of charges for nonviolent offenses	10.49 _a	7.29	15.58 _b	10.55	19.97 _c	10.38
No. of different types of crimes committed	4.47	1.78	5.72 _b	1.91	7.05 _c	1.90
Affective facilitation of lexical decision (ms)	32.35 _a	37.09	34.21 _a	42.43	9.52 _b	32.69

Note. Sample sizes were 178, 212, and 66 for control, ASPD-only, and ASPD + PSY groups in criminal conduct analyses; sample sizes were 36, 26, and 25 for control, ASPD-only, and ASPD + PSY groups in lexical decision analyses. Means with different subscripts differ significantly, $p < .05$. Control = neither antisocial personality disorder (ASPD) nor psychopathy; ASPD-only = ASPD but not psychopathy; ASPD + PSY = ASPD plus psychopathy.

$t'(90) = 6.82, p < .001, d = 1.44$, for ASPD + PSY inmates versus controls; $t'(375) = 5.61, p < .001, d = 0.58$, for ASPD-only inmates versus controls; and $t'(276) = 2.97, p = .003, d = 0.36$, for ASPD + PSY versus ASPD-only inmates.

In summary, inmates characterized by ASPD only were significantly different from control inmates on all three measures of criminal behavior. Nevertheless, inmates with ASPD + PSY were significantly more antisocial than inmates with ASPD only.

Re-Examining Relationships Between Diagnosis and Antisocial Behavior Using More Comparable Cutting Scores on ASPD and Psychopathy

In light of the different base rates of ASPD versus psychopathy in correctional settings, at least two potential explanations exist for observed group differences. One relates directly to qualitative differences between the ASPD and psychopathy criteria, and the other relates to the greater deviance or, in other words, the greater selectivity of the psychopathy criteria. To examine whether the greater antisociality of the ASPD + PSY group derives from their meeting a more strict selection criterion, we repeated the above analyses with the following change: Instead of comparing ASPD + PSY inmates and controls with ASPD-only inmates, we compared the first two groups with a group with severe ASPD but not psychopathy (severe ASPD-only). Because individuals in the ASPD + PSY group must exhibit PCL-R scores of at least 30 of 40 points or 75.0% of maximum criteria, men were classified as severe ASPD-only if they met full diagnostic criteria for ASPD and 5 or more of the 7 *DSM-IV* adult criteria or at least 71.4% of maximum criteria for ASPD and if their PCL-R scores were below 30. One hundred eight men met these stringent criteria for severe ASPD only; the mean number of *DSM-IV* adult criteria for this group was 5.60 of 7 criteria or 80.0% of the maximum criteria.

The pattern of results for antisocial behavior indexes was generally similar to that reported above. There were significant effects for group for criminal versatility, $F(2, 292) = 64.91, p < .001$; for violent charges, $F(2, 292) = 26.76, p < .001$; and for nonviolent charges, $F(1, 292) = 47.03, p < .001$. Independent t tests replicated the pattern of significant differences reported above for criminal versatility. The severe ASPD-only group committed more different types of offenses than did controls, $t(285) = 8.59, p < .001, d = 1.02$, and fewer different types of offenses than ASPD + PSY, $t(172) = 2.62, p = .01, d = 0.40$. For violent charges, the pattern of group differences was stronger for the severe ASPD-only group than that reported above in principal analyses: the severe ASPD-only group was charged with more violent offenses than were controls, $t'(203) = 4.83, p < .001, d = 0.68$, and with fewer violent offenses than were ASPD + PSY inmates, $t'(98) = 2.48, p = .015, d = 0.50$. Finally, results were different from primary analyses for nonviolent charges. Severe ASPD-only inmates were charged with more nonviolent offenses than were controls, $t(169) = 6.74, p < .001, d = 1.04$, but were not charged with significantly fewer nonviolent offenses than ASPD + PSY inmates, $t(172) = 1.07, p = .29, d = 0.16$. These analyses suggest that the difference in the severity of the diagnostic criteria may have contributed to the difference between the ASPD + PSY and ASPD-only groups in charges for nonviolent offenses but do not account for the differences in charges for violent offenses and criminal versatility reported above.

Relationships Between Diagnosis and Emotional Dysfunction

Consistent with findings reported in Lorenz and Newman (2002a), the ANOVA revealed a significant effect of group on amount of affective facilitation, $F(2, 84) = 3.53, p = .034$. Simple t tests revealed group differences similar to those reported in the psychopathy literature for trials completed with the right hand: ASPD + PSY inmates displayed less affective facilitation than did control inmates, $t(59) = 2.48, p = .016, d = 0.65$, and less affective facilitation than ASPD-only inmates, $t(49) = 2.32, p = .024, d = 0.66$, but ASPD-only inmates did not differ from controls, $t(60) < 1, ns$. Means and standard deviations are shown in Table 1.

Relationships Between Emotional Processing and Antisocial Behavior

Given the evidence that ASPD + PSY and ASPD-only inmates differed in their emotional processing, we also conducted regressions to examine whether emotional processing as measured by a laboratory paradigm would correlate with real-world antisocial behavior and whether the nature of this relationship would be similar for ASPD-only and ASPD + PSY inmates. This series of regressions included only these two groups; on successive steps, we entered a coding for group, the magnitude of affective facilitation on right-handed trials, and their interaction. Because a preliminary inspection of residuals for nonviolent and violent charges suggested that these were not normally distributed we also conducted parallel ordinal regression for this criterion variable. The results of the ordinal regressions were very similar to those of the linear regression.⁵

When group and affective facilitation were examined as predictors of the total number of charges for nonviolent offenses, neither the effect of group nor the effect of degree of affective facilitation achieved statistical significance, $F_{\text{change}}(1, 48) = 2.32, p = .135$, for group; $F_{\text{change}}(1, 47) = 2.36, p = .131$, for degree of affective facilitation (both increments in $R^2 = .046$). However, the Group \times Affective Facilitation interaction was significant, $F_{\text{change}}(1, 46) = 5.38, p = .025, \beta = -.94$, increment in $R^2 = .095$. The significant interaction is depicted in Figure 1. For ASPD + PSY inmates, reduced affective facilitation was associated with a greater number of charges for nonviolent offenses, $r(24) = -.61, p = .001$, whereas for ASPD-only inmates, reduced affective facilitation was unrelated to the number of nonviolent charges, $r(26) = .02, ns$. The difference between these correlations was significant, $Z = 2.42, p = .016$. In contrast, only group was a significant predictor

⁵ In the ordinal regression, the numbers of charges for nonviolent offenses were recoded to one of five different levels corresponding to very low, low, moderate, high, and very high levels of nonviolent offending. The ordinal regression showed that the Group \times Affective Facilitation interaction was significant, Wald's $\chi^2(1, N = 50) = 3.87, p = .049$. The ordinal regression differed from the linear regression in that the main effects for group and affect facilitation were also significant, Wald's $\chi^2(1, N = 50) = 4.31, 4.53$, both $ps < .05$, whereas group only approached significance for the linear regression. A parallel ordinal regression for number of charges for violent offenses yielded significant prediction only for group, Wald's $\chi^2(1, N = 50) = 5.35, p = .021$.

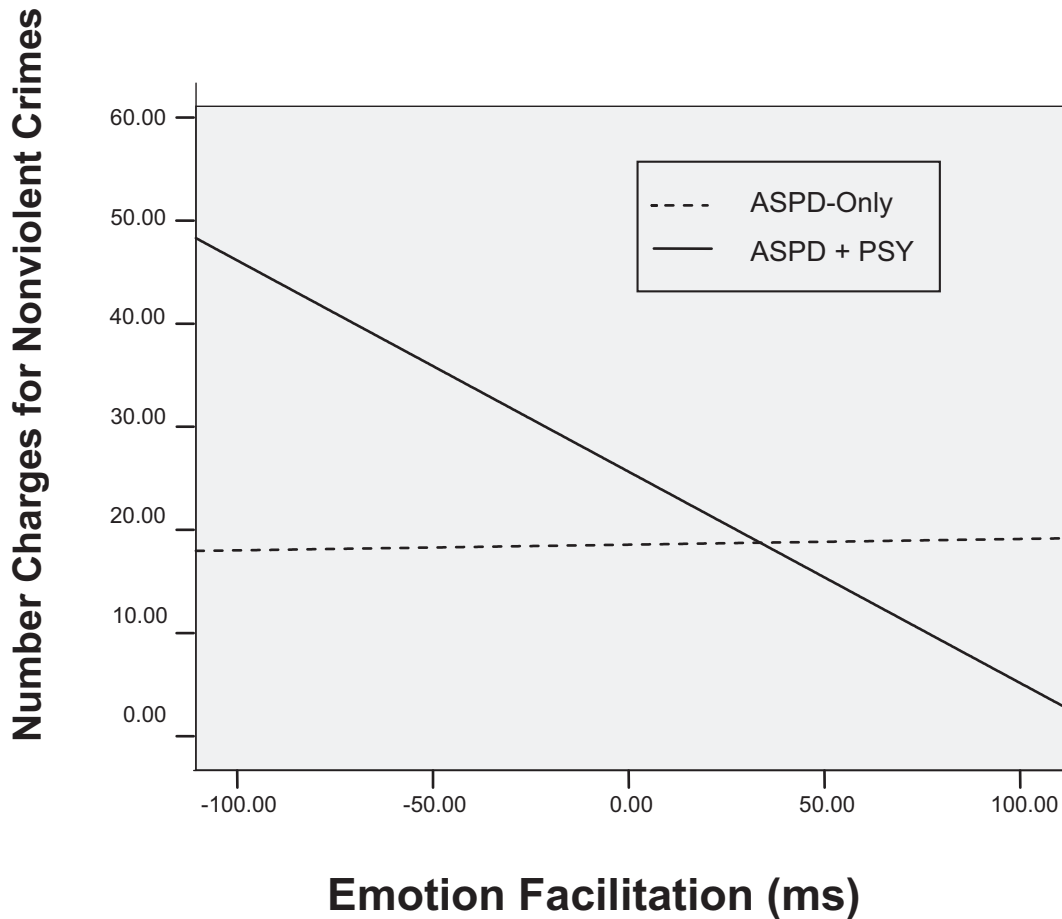


Figure 1. Group \times Affective Facilitation interaction in prediction of the number of charges for nonviolent offenses. ASPD = antisocial personality disorder.

of the number of charges for violent offenses, $F_{\text{change}}(1, 48) = 10.18$, $p = .003$, $\beta = .42$, $R^2 = .175$. Neither the degree of affective facilitation nor the interaction proved significant, both $F_{\text{changes}} < 1$, *ns*.

Finally, for criminal versatility, the group variable was significant, $F_{\text{change}}(1, 48) = 26.77$, $p < .001$, $\beta = .60$, explaining 35.8% of the variance. Although the degree of affective facilitation was not a significant predictor, $F_{\text{change}}(1, 47) < 1$, the Group \times Affective Facilitation interaction again explained unique variance in criminal versatility, $F_{\text{change}}(1, 46) = 4.71$, $p = .035$, $\beta = -.74$, increment in $R^2 = .060$. Inspection of correlations revealed that among ASPD + PSY inmates, the negative correlation between degree of affective facilitation and criminal versatility approached significance, $r(24) = -.35$, $p = .095$; in contrast, among ASPD-only inmates, there was a nonsignificant positive correlation between degree of affective facilitation and criminal versatility, $r(26) = .26$, $p = .20$. The difference between these correlations was significant, $Z = -2.09$, $p = .037$.

Discussion

Both classifications of ASPD without psychopathy and ASPD with comorbid psychopathy showed reliable links to

important real-world criteria. Even after we removed all inmates with psychopathy from the ASPD group, ASPD diagnoses remained a significant predictor of the number of charges that men received for violent and nonviolent offenses as well as for criminal versatility. At the same time, the findings that offenders with ASPD + PSY exhibited greater criminal activity and criminal versatility than inmates with ASPD alone are consistent with claims that in examining inmates with antisocial features, psychopathy also makes a unique contribution to the understanding of criminal behavior. Moreover, because we had removed the PCL-R items most directly related to antisocial behavior (Items 18 and 20) prior to conducting these ANOVAs, the greater antisociality of the ASPD + PSY individuals is not easily attributed to the use of this information in assessing psychopathy. In fact, it is likely that predictor-criterion overlap was greater with respect to the ASPD diagnosis than to the psychopathy diagnosis because overt antisocial behavior is central to several of the childhood and adult criteria for ASPD. Nevertheless, because it remains possible that scoring of several PCL-R items and diagnostic judgments regarding ASPD were influenced by information about participants' criminal histories, relationships between criminal conduct and ASPD alone or

ASPD plus psychopathy should be interpreted with caution until these findings are replicated in prospective studies.

Laboratory findings showing different patterns of results for ASPD inmates with psychopathy and those without psychopathy suggest that different psychological mechanisms characterize these two subgroups of ASPD offenders. Compared with ASPD-only inmates and with controls without ASPD or psychopathy, ASPD + PSY inmates were relatively insensitive to emotional cues; they exhibited no affective facilitation in judging the lexicality of words when using the right hand. These findings are consistent with a growing body of evidence that inmates with psychopathy display a variety of performance-related deficits under conditions that would be expected to place differential demands on left hemisphere resources (Bernstein et al., 2000; Kosson, 1996, 1998; Llanes & Kosson, 2006; Suchy & Kosson, 2005).

Moreover, the finding that the degree of affective facilitation was differentially related to both the number of charges for non-violent offenses and the number of different kinds of offenses committed suggests that there may be distinct kinds of emotional pathology in the two groups. Whereas the degree of affective facilitation correlated inversely with criminal activity in inmates with ASPD + PSY, the degree of affective facilitation correlated nonsignificantly (positively) with criminal activity in ASPD-only inmates.

One possibility consistent with the present pattern of results is that the emotion processing deficits seen in inmates with ASPD and comorbid psychopathy may contribute directly to the antisocial behavior that is often the focus of attention in studies of psychopathy. Consistent with other prominent perspectives on psychopathy (Blair, Jones, Clark, & Smith, 1997; Hare, 1998; Lykken, 1995; Patrick, 1994), Newman and Lorenz (2003) have proposed that the disinhibited, antisocial behavior of individuals with psychopathy is associated with a deficiency in using emotional and other contextual information to regulate behavior. From this perspective, increasing sensitivity to contextual emotion cues (i.e., emotion facilitation) in these individuals could be associated with fewer criminal charges being filed against them.

In contrast, the criminal behavior of individuals with ASPD only was not significantly correlated with degree of affective facilitation. Although the correlation between affective facilitation and criminal versatility ($r = .26$) was not significant in this group, the moderate effect size suggests that it might prove significant in a larger sample. Nevertheless, the direction of the correlation is opposite to the association found for the ASPD + PSY group. Thus, if anything, this nonsignificant correlation is consistent with research reported by others suggesting that much of the impulsive antisocial behavior seen in ASPD individuals without psychopathy may reflect the disinhibiting effects of excessive negative affective arousal (cf. Krueger et al., 1994; MacCoun & Newman, in press; Wallace & Newman, 1997). In any case, it appears likely that different psychological processes underlie the antisocial behavior of individuals with ASPD alone and those with ASPD and psychopathy, and clarifying the nature of these processes may have important implications for developing more specific and efficacious therapeutic interventions.

In summary, current results are consistent with the possibility that distinct syndromes characterize offenders with ASPD and comorbid psychopathy versus offenders with ASPD but without comorbid psychopathy. Current findings are not consistent with

the argument that the validity of ASPD is dependent on the comorbidity between ASPD and psychopathy. Nor are current findings entirely consistent with the perspective that these two syndromes simply reflect different levels of the same underlying pathological process. Such an argument might be raised with respect to the criminal activity findings, with the implication that individuals with psychopathy are characterized by a more severe form of ASPD than are individuals with nonpsychopathic ASPD. However, the finding that individuals with severe ASPD but not psychopathy exhibited less criminal activity than individuals with psychopathy suggests that the severity of the ASPD is not the sole reason for group differences. More important, this perspective cannot explain observed differences in the processing of emotional information or the different relation between emotional processing and antisocial behavior observed in the two groups.

At the same time, because the current study is the first to distinguish ASPD with psychopathy from ASPD without psychopathy in this way, results should be regarded as preliminary pending replication in other samples and with other analytic strategies and measures. Indeed, given the wide variety of performance deficits and physiological anomalies reported in prior research with individuals with psychopathy as well as in prior research with individuals with ASPD, it should be straightforward to examine whether the current pattern of findings can be replicated using measures in other domains of functioning.

In addition, some limitations of the current study should be emphasized. First, the current study was limited to a sample of inmates. Thus, although this sample was relatively large and appeared representative in many respects of samples used in most prior studies of psychopathy and ASPD, a general limitation of most of this research is that correctional samples may not be representative of offenders in general. In addition, because some behavioral deficits identified in European American offenders with psychopathy, including the affective processing deficit examined in this study, do not replicate in African American offenders with psychopathy (Donnellan, Ge, & Wenk, 2000; Kosson et al., 1990; Lorenz & Newman, 2002a, 2002b; Thornquist & Zuckerman, 1995), the current analysis was limited to European Americans. Thus, it remains possible that the differential relationships observed between emotional processing anomalies and antisocial behavior, like some behavioral deficits themselves, would not generalize to samples of African American offenders. In addition, given the overrepresentation of ethnic minorities in U.S. prisons, it is important to examine whether differences between ASPD with psychopathy and ASPD without psychopathy generalize to African American and other ethnic minority populations. Finally, an additional weakness of the supplementary analysis being limited to men meeting 5 or more of the 7 *DSM-IV* adult criteria for ASPD should be noted. Given that the *DSM-IV* criteria for ASPD and the PCL-R items differ in the number of items and may also differ in the difficulty of the items, our analysis does not ensure that the severe ASPD-only and the ASPD + PSY groups were comparable in their severity.

At the same time, current findings are provocative. Given the substantial construct validity of both ASPD and psychopathy and given that the current (albeit limited) literature suggests that adult inmates with ASPD and psychopathy may be less amenable to treatment than those with ASPD alone (Cacciola, Alterman, Rutherford, & Snider, 1995; Hare, Clark, Grann, & Thornton, 2000; but

see also Skeem, Monahan, & Mulvey, 2002), additional studies addressing the heterogeneity of ASPD are important and could be useful in determining whether comorbid psychopathy serves to identify a more etiologically homogeneous ASPD subtype with differential treatment needs.

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