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ORIGINAL ARTICLE

Relation of Antisocial and Psychopathic Traits to Suicide-related Behavior Among Offenders

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Abstract Offenders with antisocial traits are relatively likely to attempt suicide, largely because they are more likely to have high negative emotionality and low constraint. Among 682 male offenders, we tested whether negative emotionality, low constraint, and also substance use problems mediated any relationship between antisocial personality disorder (ASPD) and psychopathy on the one hand, and suicide-related behavior (SRB) and ideation on the other. ASPD and the impulsivity/lifestyle features of psychopathy weakly predicted SRB. High negative emotionality and low constraint (but not substance use) mediated the relation between ASPD and SRB. Impulsivity/lifestyle features of psychopathy retained an independent predictive effect. Self-report psychopathy measures added unique predictive variance to the Psychopathy Checklist—Revised. We discuss implications for suicide risk assessment and prevention.

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Suicide is the eleventh leading cause of death among adults in the United States (U.S. National Center for Health Statistics 2003) and has been a major focus of research in the behavioral sciences. Most research focuses on the correlates of suicide attempts and completed suicide (for reviews, see Maris et al. 2000; Beautrais et al. 2000). The most robust correlates are past suicide-related behavior and certain psychiatric diagnoses. Among the replicated diagnostic harbingers of attempted or completed suicide are major depressive and bipolar disorders (Takahashi 1993), alcohol/drug dependence (Roy and Linoila 1986), schizophrenia (for completed suicide; Heila and Lonnqvist 2003), and borderline and other "externalizing" personality disorders (Brodsky et al. 1997; Duberstein and Conwell 1997).

These forms of psychopathology are overrepresented in forensic and correctional settings. Compared with the general population, the 6-month prevalence of serious mental disorder among jail detainees is nearly four times higher for men and over eight times higher for women (Teplin 1994; Teplin et al. 1996, Fazel and Danesh 2002). Of detainees with mental disorder, 75% have a co-occurring substance use disorder (Teplin et al. 1996). Given this overrepresentation of mental disorder and the stress that can accompany arrest and incarceration, risk of suicide is especially salient in forensic and correctional settings. A report by the World Health Organization (2000) noted that "[s]uicide is often the single most common cause of death in correctional settings" (p. 5), and reviews indicate that "...both absolute numbers of suicide and suicide rates in jails and prisons have increased in most countries within

the last decades" (Fruehwald et al. 2003, p. 161, cites omitted) with rates (in jails) "8–14 times greater than in the general population" (Charles et al. 2003, p. 65, cites omitted). As such, understanding the determinants of suicidality within offender samples could have considerable preventive value.

ASPD, Psychopathy, and Suicide

A disorder that is highly prevalent in these settings and has been linked to suicidal behavior is antisocial personality disorder (ASPD). Indeed, the DSM-IV (American Psychiatric Association, 2000) lists suicide as an associated feature of ASPD, and several investigators have reported elevated rates of suicide in ASPD samples (Black 1998; Black and Braun 1998; Lester 1998; cf. Woodruff et al. 1972). Understanding the relationship between ASPD and suicidality, however, is challenging, in part because of confusion regarding the relationship of psychopathy to both of these constructs. On the one hand, the DSM-IV describes psychopathy as essentially synonymous with ASPD (American Psychiatric Association 2000). So, one would expect psychopathy, like ASPD, to predict suicide-related behavior. On the another hand, Cleckley's (1976) classic clinical description of psychopathy did not emphasize antisocial behavior and included the descriptor "suicide rarely carried out." Here, one would expect psychopathy to be inversely related to suicide. We must clarify the conceptual and empirical relationships among ASPD, psychopathy, and suicidality to inform forensic clinicians' ability to predict and manage suicidal behavior.

Empirically, ASPD and psychopathy overlap only moderately (Hare 1991, 2003; Lilienfeld 1994). Whereas ASPD is defined largely in terms of a history of irresponsible and illegal behaviors, psychopathy is defined largely in terms of affective and interpersonal personality traits, such as guiltlessness, callousness, egocentricity, manipulativeness, fearlessness, and incapacity to form deep emotional attachments (Hare 1991, 2003; Lykken 1995). The most commonly used measure of psychopathy is the *Psychopathy Checklist—Revised* (PCL-R; Hare 1991, 2003), which raters complete by integrating information from a semi-structured interview and a review of file information. Early factor analyses of the PCL-R (Harpur et al. 1989), and more recent analyses of some self-report measures (Benning et al. 2003) have often yielded a two-factor structure, with one dimension (Factor I) comprising interpersonal and affective deficits (e.g., lack of guilt; selfishness) and the other dimension (Factor II) comprising an antisocial and impulsive lifestyle. Given its behavioral focus, PCL-R Factor II is strongly associated with diagnoses and symptom counts of ASPD, with correlations between r = .41 and .83 (Hare 1991, 2003).

However, more recent research—including factor analyses conducted within the current sample (Skeem et al. 2004)—has supported a three-factor model in which Factor I is parsed into nested affective and interpersonal factors, and Factor II is pared down to items tapping a more trait-like construct consisting of impulsivity and irresponsibility, and omitting items related more directly to counts of criminal and other antisocial behavior (Cooke and Michie 2001; Cooke et al. 2007). Hare (2003) advocated including a fourth "Antisocial" factor consisting of criminal behavior and social deviance items that were deleted from the three-factor model that, along with the impulsive lifestyle factor, is nested under Factor II.

Scant empirical work has examined the relation between psychopathy and suicidal behavior. Based on a sample of 313 male prison inmates, Verona et al. (2001) reported that PCL-R Factor II, but not Factor I, traits were modestly but significantly associated with past self-reports of attempted suicide. This observation was replicated in a multisample analysis of 1,711 forensic patients, criminal offenders, psychiatric patients, and justice-involved youth (Douglas et al. 2006). After controlling for the association between the two factors, suicide indices bore a weak relation to Factor II (r_{pb} = .13) and essentially no relation to Factor I (r_{pb} = .01). Further, in Verona et al. (2001), the relation between Factor II traits and suicidal actions was significantly attenuated when scores on self-report measures of (reversed) constraint and negative emotionality were statistically controlled. This finding suggests that the association between PCL-R Factor II and attempted suicide is attributable to the variance it shares with poor impulse control and sensation seeking (reversed constraint) and a propensity toward anxiety, hostility, and mistrust (negative emotionality). These results were replicated in a sample of 226 female prison inmates (Verona et al. 2005). In contrast to the previous investigation, this latter study of women revealed that Factor I traits exerted a significant protective effect against attempted suicide, and that this protective effect was not accounted for by measures of constraint or negative emotionality.

The Present Study

Several important questions concerning the relation between psychopathy and ASPD, on the one hand, and suicidal behavior, on the another, remain unanswered. In this study, we extend the investigation of Verona et al. (2001) by examining a broader array of constructs, using both interview- and self-report measures of ASPD and psychopathy, and exploring the potential mediating role of

additional theoretically relevant variables. First, we ascertain the extent to which psychopathy and ASPD are predictive of suicidal ideation and suicide-related behavior, rather than focusing exclusively on suicide attempts. We define suicide-related behavior (SRB) as potentially self-injurious behavior in which the person either intended at some non-zero level to kill himself or herself (*suicide attempt*), or wished to use the appearance of a suicide attempt to achieve some other purpose (*instrumental SRB*; O'Carroll et al. 1996). Since both suicidal ideation and SRB are relatively strong predictors of completed suicide (Cooper et al. 2005; Roberts et al. 1998), and there is relatively little research on SRB per se (Skeem et al. 2006), these associations are of pragmatic and theoretical importance.

We also compare the independent relationships of ASPD and psychopathy with suicidal ideation and SRB. This issue is important because ASPD and psychopathy may be differentially associated with suicide propensity. Since ASPD is more heavily saturated with impulsivity than is psychopathy (Hare 2003), it may more strongly predict SRB. In contrast, psychopathy, or at least certain aspects of it, may 'protect' against SRB (Verona et al. 2005), in keeping with Cleckley's (1976) conceptualization of psychopathy as associated with potentially adaptive functioning, in which suicide is rarely carried out. Second, we use both interview-based and self-report measures of psychopathy, ASPD, and suicidality to address the possibility that prior research findings reflect mono-method bias associated with sole use of clinician-rated instruments.

Third, although we test the traditional, two-factor model of the PCL-R for replication purposes vis-à-vis Verona et al. (2001), it is increasingly clear that this structural model rests on a little empirical support (Cooke and Michie 2001; Cooke et al. 2007; Hare 2003). As such, we focus on the PCL-R three-factor model of psychopathy, which has been shown to fit our data. We explore whether Hare's fourth 'antisocial' factor relates to our outcomes, even though the criminal and antisocial behaviors that it distills might best be considered correlates of psychopathy, rather than intrinsic to psychopathy per se (Cooke et al. 2007; Skeem and Cooke in press). We explore each of the four scales to shed light on the relative construct validity of the various PCL-R models. Although some past research (Verona et al. 2005) suggests that Factor I and Factor II are inversely and positively related to suicide attempts, respectively, it is unclear which features account for this relationship. For example, it is important to know whether the Factor II-suicide attempt relationship is accounted for entirely by the impulsive and irresponsible traits indexed by Factor three of the PCL-R, or whether criminal history and antisocial behavior (as indexed by Factor four on Hare's four-factor model), which could be argued to stem from traits underlying Factor 3 (Cooke et al. 2007; Skeem and Cooke in press), provides additional information vis-à-vis predicting suicidality.[1]

Fourth, we extend the mediators examined by Verona et al. (2001) by evaluating the potential mediating role of alcohol and drug use problems. Research shows a strong association between substance use problems and ASPD and psychopathy, on the one hand (i.e., Hare 2003), and suicide-related behavior on the other (Maris et al. 2000). These findings bear important implications. If the association between ASPD and SRB is explained by the relation of both variables to alcohol use problems, then such problems could be more direct treatment targets than ASPD traits for reducing suicide potential. Ideally, treatment would focus on the features that relate most directly to suicide risk. Second, beyond such practical implications, these analyses may lead to important theoretical insights. They should shed light on the extent to which the association between antisocial features and suicidal behavior is attributable to underlying personality dimensions (low constraint) or co-occurring conditions (substance use problems).

Method

Participants

Participants were 682 male offenders either incarcerated in prisons, or attending substance-related residential treatment (all of whom were court-ordered) recruited from state prisons and residential drug treatment sites in Florida, Nevada, Oregon, Texas, and Utah. Eligibility criteria for study inclusion were: (1) target age of 21–40 (inclusive), though RAs recruited older participants when those between 21 and 40 were not available; (2) African American or White, (3) English-speaking, (4) estimated screening IQ $\geq$ 70, and (5) not receiving psychotropic medication for active symptoms of psychosis. Approximately half (51%) of participants were drawn from residential drug treatment sites. Of participants, 70% were White, and 30% were African American; 10% additionally identified themselves as Hispanic. Their mean age was 31.2 years (SD = 7). Data were missing on some variables,

[1] For clarity, we use "Factor I" and "Factor II" to refer to the generic distinction between affective/interpersonal and behavioral features of psychopathy, regardless of measure. We also use these terms to refer to the 'old' PCL-R two-factor structure. Hence, "factors" one through four (that is, no Roman numerals) refer to newer three- and four-factor models of the PCL-R. These are sometimes referred to as "facets," as they are in Hare (2003), despite being nested factors.

in which case analyses were conducted using pairwise deletion.

Two of the measures—the PPI and PAI (see below)—contain validity scales, both of which are designed to detect respondents who are answering similar items in an inconsistent or random fashion. We deleted from analyses participants with highly elevated scores on either the PAI Inconsistency scale (n = 12; T score of 73 and above), or the PPI VRIN scale (n = 6; scores >2 standard deviations above mean). This reduced the sample from 682 to 664 participants.

Measures

This study included measures designed to ensure meaningful participation in the study (e.g., requiring participants to meet IQ eligibility criteria), and to address the study's substantive aims. In addition to background variables, three substantive groups of variables were measured: (a) predictive variables of psychopathy and ASPD; (b) criterion variables of suicide-related behavior; and (c) variables hypothesized to mediate the relation between these personality features and suicidality.

Background Measures

Intelligence Screen

The Quick Test (QT; Ammons and Ammons 1962) is a brief screening measure of intellectual functioning that requires participants to associate words with pictures. The QT is predictive of IQ scores in the normal range (Traub and Spruill 1982) and generalizes to offender (DeCato and Husband 1984; Simon 1995) and African American (Craig and Olsen 1988) samples. Although none of the participants in the current sample fell below our screen-out cut-off (<70), six individuals who completed enrollment procedures fell below our screen-out cut-off (<70) and hence were not recruited into the study.

Reading Screen

The Basic Reading Inventory (Johns 1997) was used to assess the reading ability of participants if they had not completed the twelfth grade or obtained a GED, and demonstrated difficulty reading the first few items of the Personality Assessment Inventory (see below). These participants read silently a ninth grade level passage from the BRI and then completed an oral test of comprehension. Research assistants (RAs) read all self-report measure items aloud to participants who did not demonstrate a ninth grade reading level. In order to reduce the possibility of socially desirable responses, participants indicated their responses to the questions privately (out of the RAs' view).

Predictors: Psychopathy and ASPD

Psychopathy

Psychopathy was assessed using both an interview-based and self-report measures. The *Psychopathy Checklist—Revised* (PCL-R; Hare 1991, 2003) is an interview-based measure consisting of 20 items associated with psychopathic personality. A trained rater integrates information from an interview and review of the individual's institutional file to score each item for its degree of match to him or her, using a scale that ranges from "0" (item does not apply), to "2" (item definitely applies). The reliability and validity of the PCL-R is well documented, as is its predictive utility for violent behavior (Hare 1991, 2003). Since a 3-factor model provides the best fit to the present data (Skeem et al. 2004), and we wished to reduce the overlap between psychopathy and ASPD for these analyses, we computed composite scores representing interpersonal (Hare's "Facet 1"), affective ("Facet 2"), and impulsive lifestyle ("Facet 3") domains (Cooke and Michie 2001) for use in addition to the traditional Factor I and II coding, which we used for replication purposes vis-à-vis Verona et al. (2001). We also calculated Hare's fourth factor ("Antisocial"). As we described earlier, we did so to facilitate a comparison of construct validity across models. The average PCL-R total score was 22.8 (SD = 7.4).

Interrater reliability of the PCL-R was determined through observation of RAs' PCL-R interviews of study participants (in addition to the requisite file review). All such observations were conducted by the first author (whose PCL-R scores were treated as the "criterion" against which RA scores were measured), who traveled to each site approximately every 6 months and observed two cases per visit, for a maximum of four visits. Given some minor variations in this general procedure, there were a total of 51 live interrater reliability cases. The interrater reliability (ICC_1) for PCL-R total scores was .88. Alpha and mean interitem correlation [MIC] for PCL-R scores were as follows: Total score (α = .81, MIC = .18), Factor I (α = .80, MIC = .34), Factor II (α = .69, MIC = .20), Facet 1 (α = .70, MIC = .36), Facet 2 (α = .77, MIC = .45), Facet 3 (α = .64, MIC = .27), and Facet 4 (α = .61, MIC = .24).

The *Psychopathic Personality Inventory* (PPI; Lilienfeld and Andrews 1996) is a 187-item self-report measure designed to assess the principal personality traits of

psychopathy. It consists of eight factor-analytically derived subscales that assess specific facets of psychopathy. Higher-order factor analyses of these subscales have in turn yielded a two-factor structure, with Factor I consisting of standardized scores on three of the original subscales (Social Potency, Fearlessness, and Stress Immunity) and Factor II consisting of standardized scores on four additional subscales (Machiavellian Egocentricity, Blame Externalization, Carefree Nonplanfulness, and Impulsive Nonconformity). The Coldheartedness subscale does not load highly on either factor (see Benning et al. 2003). PPI Factor I assesses fearlessness, dominance, and a lack of interpersonal, psychological, and physical anxiety, whereas PPI Factor II assesses self-centered impulsivity combined with a tendency to manipulate and blame others. PPI total scores are moderately to highly (∼.30–.50) associated with other self-report measures of psychopathy and with interview-based measures of psychopathy, such as the PCL-R (Poythress et al. 1998). In addition, PPI Factors I and II display different correlates from one another in the domains of personality and psychopathology; for example, PPI Factor I tend to be either uncorrelated or positively correlated with measures of education and vocabulary, whereas PPI Factor II tends to be negatively correlated with these variables. Moreover, PPI Factor II, but not Factor I, tends to be positively associated with measures of antisocial behavior and substance abuse (Benning et al. 2003; Patrick et al. 2006). In the current sample, the alphas of the subscales that comprise PPI-I ranged from .79 (for both Social Potency and Fearlessness) to .87 (Stress Immunity), and for the subscales that comprise PPI-II, they ranged from .76 (Impulsive Nonconformity) to .90 (Machiavellian Egocentrism), with Carefree Nonplanfulness (.81) and Blame Externalization (.88) in between. For the PPI total score, α = .92, and MIC = .06.[2]

Personality Assessment Inventory, Antisocial Features Scale (PAI ANT, Morey 1991)

The ANT scale is a component of Morey's *Personality Assessment Inventory* (Morey 1991), a (non-overlapping) multi-scale, self-report inventory designed to assess psychopathology and clinically relevant constellations of personality traits. ANT was designed to tap the core affective, interpersonal, and behavioral features that have been traditionally associated with psychopathy and antisocial personality. It consists of three conceptually distinct subscales designed to tap narrower facets of psychopathic and antisocial symptomatology: ANT-A (Antisocial Behaviors), which assesses a history of conduct problems and criminality; ANT-S (Stimulus Seeking), which reflects a tendency toward thrill-seeking and low boredom tolerance; and ANT-E (Egocentricity), which taps a self-centered, callous, remorseless interpersonal style "often thought to lie at the core of this disorder" (Morey 1991, p. 72).

Internal consistency for ANT among offender samples typically has been very good (e.g., α = .82; Edens and Ruiz 2005). In terms of validity data, ANT typically correlates moderately to highly with other measures of psychopathic traits such as the PCL-R and PPI. ANT also has been shown to be predictive of various types of theoretically relevant forms of social deviance (e.g., institutional adjustment difficulties) among offenders (for a review, see Edens and Ruiz 2005).

A comparison of the item content of these subscales suggests that ANT-E is roughly analogous to PCL-R Factor I, whereas ANT-S and ANT-A both tap features of PCL-R Factor II. As such, in this study we used ANT-E as a proxy for Factor I and the mean of ANT-S and ANT-A as a proxy for Factor II. For ANT total score, α = .75, and MIC = .11. For ANT-E, α = .67, and MIC = .22; For ANT-S, α = .78, and MIC = .30; for ANT-A, α = .70, and MIC = .22.

Antisocial Personality Disorder (ASPD)

The ASPD module of the *Structured Clinical Interview for DSM-IV Axis II* (SCID-II; First et al. 1996) was used to assess ASPD. This module is a semi-structured psychiatric interview that assesses the DSM-IV criteria for ASPD (First et al. 1995), and yields both dimensional and categorical scores for ASPD. The ASPD module exhibits high levels of interrater reliability (mean *Kappa* = .72; Dreessen and Artnz 1998; Maffei et al. 1997; Weiss et al. 1995) and high concurrent validity for expert diagnoses of ASPD (r = .95; Skodol et al. 1988). In this study, the interrater reliability (*Kappa*) for ASPD diagnoses, based on the same observation procedure used to determine PCL-R interrater reliability, was .74 (N = 50),[3] and for total symptom count, ICC_1 = .86 (N = 46).

Personality Diagnostic Questionnaire-4 (PDQ-4) ASPD Scale (Hyler 1994, Unpublished Manuscript)

The PDQ-4 ASPD scale consists of 22 true–false self-report items, one for each ASPD criterion in DSM-IV. In a

[2] MIC can be expected to be low for the PPI Total score because items for its two scales, PPI-I and PPI-II were intended to tap orthogonal constructs, and hence would not be expected to relate to variance within the total score attributable to the converse factor.

[3] Raters agreed on 44 of 50 cases.

sample of 300 psychiatric patients, Fossati et al. (1998) reported that the PDQ-R ASPD scale had an internal consistency (α) of .63 and correlated with the SCID-II ASPD scale at r = .37. In a sample of 62 male prisoners, Davison et al. (2001) found that the Kappa coefficient for diagnostic concordance between the PDQ-4 and SCID-II ASPD scales was .49. Their Receiver Operating Characteristics analyses (area under the curve [AUC] = .83) suggested that this scale could serve as a useful screening measure for ASPD in prison samples. Further, in an analysis of this issue based on data from the current study, we found an AUC of .80 between the PDQ-4 and SCID-based ASPD diagnoses (Guy et al. in press). In this study, we administered the PDQ-4 ASPD scale to provide an alternative indicator of ASPD to the SCID-II ASPD scale.

Criterion: Suicide-related Behavior & Ideation

Given problems inherent in defining various forms of suicide-related behavior (SRB), we adopted O'Caroll and colleagues' (1996) definition of *SRB* as potentially self-injurious behavior in which the person either intended at some non-zero level to kill himself (suicide attempt), or wished to use the appearance of such to attain some other end (instrumental suicide-related behavior). In this study, SRB was coded from participants' response to the PCL-R interview question, "Have you ever tried to commit suicide?" Those who answered in the affirmative were assumed to have engaged in some past act of self-harm. However, the intent behind these acts was often unclear. Thus, instead of attempting subjectively to distinguish between suicide attempts (where there is a non-zero level of intent to die) and instrumental suicide-related behavior (all other self-harm), we grouped all potentially self-injurious behavior elicited in response to questioning about suicidality together as SRB, as defined above. SRB was coded retrospectively and dichotomously as having ever occurred. This coding procedure is consistent with and hence facilitates direct comparison with that used by Verona et al. (2001, 2005). In the present sample, 138 out of 647 (21.3%) participants indicated that they had attempted suicide.

Suicidal ideation was operationalized using the 12-item Suicide Ideation (SUI) subscale of the PAI. None of the items on SUI overlap with items from any other PAI subscale. It assesses suicidal thoughts and feelings, rather than past behavior. The SUI has excellent internal consistency (for African Americans and Whites) and test–retest reliability, and is strongly associated with measures of suicidal ideation, hopelessness, and depression (Morey 1991) that have been shown to predict SRB (e.g., Beck and Weishaar 1990; Range and Knott 1997). SUI scores also have been moderately to strongly associated with other indicators of suicidal ideation and gestures in multi-ethnic offender samples (for a review, see Edens et al. 2001). In this sample, α = .89 and MIC = .45. The mean SUI T-score in the current sample was 53.79 (*SD* = 14.09).

Potential Mediators of the Psychopathy/ASPD—Suicidality Relationship

Negative Emotionality (NE)

NE was operationalized using the PAI (Morey 1991). Principal components analysis was used to reduce all PAI scales except the validity scales and clinical and treatment scales that clearly overlapped (conceptually) with the criteria or other predictors. On this basis, we excluded the Suicidal Ideation (SUI), Borderline Features-Self Harm (BOR-S), Antisocial Features (ANT), and Aggression (AGG) subscales. This analysis yielded a five-component solution; we defined the first unrotated component as NE. The scales with the highest loadings (>.70) on this component were drawn primarily from the Anxiety, Anxiety Related Disorders, Depression, Schizophrenia, and Borderline scales, strongly corroborating the claim that this initial component represents NE (see Watson and Clark 1984). Additional PAI scales with loadings between .60 and .70 were Somatic Complaints, Stress, Nonsupport, and Paranoia. We derived the actual NE scale used in analyses by summing participants' scores across the various scales on this first component, weighted by variables' component loadings.[4]

Low Constraint

In order to measure low constraint, we developed a composite index using Z-transformed scores on the Harm Avoidance (HA) subscale of the Multidimensional Personality Questionnaire (MPQ, Full Form; Tellegen in press), and the Barratt Impulsiveness Scale, eleventh version (BIS-11, Patton et al. 1995). The MPQ is a self-report instrument that assesses a wide range of basic personality traits. The HA is a 28-item subscale reflecting (reversed) tendencies toward sensation seeking and fearlessness. In the present sample, α = .86 and MIC = .18. The BIS-11 is a 30-item scale that assesses motor or behavioral impulsiveness, cognitive or attentional impulsiveness, and impulsivity-nonplanning (lack of concern for the future). In the present sample, α = .84 and MIC = .15.

[4] Component loadings are available from the first author upon request.

Substance Use Problems

The 12-item alcohol problems (ALC) and the 12-item drug problems (DRG) subscales were used to assess the degree, nature, and consequences of substance abuse. Both of these scales possesses evidence of strong reliability and construct validity (Morey 1991). Reliabilities in the present sample were as follows: ALC (α = .94, MIC = .56); and DRG (α = .89, MIC = .41).

Procedure

Research assistants (RAs) were trained in the administration of the study protocol prior to data collection. Each RA was trained to reliability on the interview-based measures of psychopathy and ASPD. After training, RAs were required to code 10 PCL-R training cases based on videotaped interviews and case file material (training materials supplied by Robert Hare). Their scoring and progress were discussed with the first author following the second, fifth, and tenth cases. RAs were required to have demonstrated reliability (ICC_1) of .80 or greater against the criterion scores for the training cases prior to commencing data collection. All but two RAs met reliability requirements by the tenth case, with the remaining two requiring additional supervision and two more practice cases prior to commencing data collection.

At each site, RAs randomly selected potential participants from lists of individuals who met the age, ethnicity, and language inclusion criteria for the study. Enrollment interviews were conducted in a private room and informed consent was obtained using procedures approved by a university institutional review board. After informed consent was obtained, the IQ screening and reading ability tests were administered. The research protocol was then administered to eligible participants. Although the PAI was administered as a paper-and-pencil measure, the PPI, and PDQ-4 ASPD scales were entered into a software program and participants completed them using a laptop computer. The study protocol included several measures, took on average 4.5 h to complete, and typically was administered in two sessions. At the end of protocol administration, $20 was deposited into the agency account of each participant for the time they contributed to the study, unless reimbursement was prohibited by the agency's policies (one site).

Results

Associations Among Measures

In order to contextualize the presentation of results, we present correlations among the total (and, when applicable, scale) scores for the primary measures of SRB, ASPD, and psychopathy. The two SRB measures were moderately correlated (r_{pb} = .48; n = 599; $p \leq .001$). The ASPD measures (SCID and PDQ-4 total symptom counts) were strongly correlated (r = .68; n = 623; $p \leq .001$). In contrast, the psychopathy measures were weakly to moderately correlated. Specifically, PCL-R Total correlated with PPI Total at .39 (n = 642, $p \leq .001$), and PAI ANT Total at .35 (n = 594; $p \leq .001$). PPI and ANT Totals were strongly correlated (r = .74; n = 594; $p \leq .001$). Within the psychopathy measures, the inter-scale associations varied. Within the PCL-R, Factors I and II correlated at .43 (n = 657; $p \leq .001$), and correlations among Factors 1 through 4 ranged from .24 (n = 660; $p \leq .001$; for Facets 1 and 4) to .53 (n = 623; $p \leq .001$; for Facets 1 and 2). Consistent with prior research with offenders (Patrick et al. 2006), PPI-I and PPI-II were uncorrelated (r = −.05; n = 658; *ns*), whereas ANT-E and ANT-A + S were strongly correlated (r = .60; n = 609; $p \leq .001$). The primary measure of ASPD (SCID Total symptom count) was moderately correlated with PCL-R total scores (r = .59; n = 616; $p \leq .001$), PPI (r = .48; n = 628; $p \leq .001$), and with ANT A + S (r = .53; n = 566; $p \leq .001$). It correlated more highly with PCL-R Factor II (r = .66; n = 597; $p \leq .001$) than Factor I (r = .38; n = 600; $p \leq .001$).

Bivariate Analyses

Antisocial Personality Disorder

Table 1 presents the findings from contingency analyses between ASPD diagnostic status on the SCID and PDQ-4 and both the presence of SRB and high levels of suicide ideation. For both the SCID and PDQ-4, we calculated the presence of SRB and suicidal ideation as a function of whether the full ASPD diagnostic criteria (including childhood conduct disorder) were met, and whether the adult ASPD criteria (only) were met. All associations between ASPD and suicidality were statistically significant except for SCID ASPD (full diagnostic criteria) and SRB. In order to estimate the strength of association between ASPD diagnostic status and suicidality, we calculated odds ratios (ORs) for each of the analyses presented in Table 1. These ranged from 1.24 to 3.01, with six out of eight being above 2.0. Since epidemiologists usually consider ORs of 2.0–3.0 to represent the lower bound of a clinically meaningful association between variables (Fleiss et al. 1986), most of the ORs indexed somewhat meaningful effect sizes.

Analyses of zero-order correlations were consistent with contingency analyses (see Table 2). All zero-order correlations between ASPD indices and suicidality indices were

Table 1 Suicide-related behavior (SRB) and ideation as a function of ASPD diagnostic status

ASPD index	SRB *N* (%)	Suicide ideation *N* (%)
SCID (Full criteria)		
Yes	79/344 (23.0)	146/317 (46.1)[a]
No	53/274 (19.3)	88/253 (34.8)
(Odds)	(1.24)	(1.60)
SCID (Adult criteria)		
Yes	110/456 (24.1)[a]	193/424 (45.5)[b]
No	22/162 (13.6)	41/146 (28.1)
(Odds)	(2.02)	(2.14)
PDQ-4 (Full criteria)		
Yes	93/328 (28.4)[b]	159/301 (52.8)[b]
No	40/298 (13.4)	78/277 (28.2)
(Odds)	(2.55)	(2.86)
PDQ-4 (Adult criteria)		
Yes	97/363 (26.7)[b]	173/333 (52.0)[b]
No	37/264 (14.0)	65/246 (26.4)
(Odds)	(2.24)	(3.01)

Notes: [a] $p \leq .01$; [b] $p \leq .001$. Suicide Ideation variable is a dichotomous indication of whether a person scored above, versus below or at, the median (*Mdn* = 49) on the PAI Suicide Ideation scale

Table 2 Bivariate correlations between measures of antisocial personality disorder and suicide-related behavior and ideation

ASPD index	SRB (r or r_{pb})	Suicide ideation (r or r_{pb})
SCID		
Symptom count	.04	.16[b]
Meets diagnostic criteria	.04	.10[a]
SCID adult		
Symptom count	.10[a]	.16[b]
Meets diagnostic criteria	.11[a]	.11[a]
PDQ-4		
Symptom count	.13[b]	.25[b]
Meets diagnostic criteria	.18[b]	.22[b]
PDQ-4 adult		
Symptom count	.12[a]	.24[b]
Meets diagnostic criteria	.15[b]	.22[b]

Notes: [a] $p \leq .01$; [b] $p \leq .001$. *N* for PDQ-4 (Symptom count and diagnostic criteria met) and Attempts = 626; PDQ-4 (Adult symptom count and diagnostic criteria met) and Attempts = 627; PDQ-4 (Symptom count and diagnostic criteria met) and ideation = 578; PDQ-4 (Adult symptom count and diagnostic criteria met) and ideation = 579; SCID Symptom count and attempts = 598; SCID Adult symptom count and attempts = 617; SCID Symptom count and ideation = 551; SCID Adult symptom count and ideation = 569; SCID Meets diagnostic criteria (full and adult) and attempts = 618; SCID Meets diagnostic criteria (full and adult) and ideation = 570

It is possible that the correlations with suicide ideation were larger than with SRB because the former index is continuous and the latter is dichotomous. To address this possibility, we dichotomized the suicide ideation index (PAI SUI Scale) using a median split (T-scores up to 49 recoded as 0; T-sores of 50+ recoded as 1), and re-ran the analyses with the SCID and PDQ-4. In no case did the observed correlation coefficients become smaller with the dichotomized Suicide Ideation index; in fact, they all increased between .01 and .03 (details available upon request)

statistically significant except for the correlation between SCID ASPD (full diagnostic criteria) and past SRB. Most correlations, although significant, were small in magnitude, although some were closer to moderate in size (i.e., PDQ-4 full and adult symptom count and suicidal ideation).

Psychopathy

For each measure of psychopathy (PCL-R, PPI, PAI ANT), we computed zero-order and partial correlations with the two suicidality indicators (see Table 3). We also conducted partial correlation analyses because some measures of psychopathy include "Factor II" scales that overlap heavily with indices of ASPD, and most of the psychopathy subscales correlated with one another. As noted earlier, we wished to examine the independent relationships of ASPD and psychopathy to suicidal ideation and SRB because the two constructs may be differentially associated with suicide propensity. Partial correlation analyses were used to estimate the relationships between each psychopathy dimension and the suicide indices, controlling for the other psychopathy dimension(s).

The relationships between overall PCL-R psychopathy and SRB (r_{pb} = .07, p = .066) and suicidal ideation (r = .07, *ns*) were small and non-significant. The PCL-R's measurement of the core affective and interpersonal features of psychopathy (Factor I, and its nested subfactors, Facets 1 and 2) were not significantly related to either suicide index at the zero-order level. However, partial correlations revealed evidence of a cooperative suppressor effect (see also Hicks and Patrick 2006) for the interpersonal facet of the PCL-R in its association with suicide ideation—whereas the correlation between this PCL-R facet and suicide ideation was not significant at the zero-order level, this facet showed a negative association with suicide ideation after controlling for scores on the other PCL-R facets. The behavioral/social deviance (ASPD-like) aspects of the disorder (Factor II) were weakly, although significantly, related to suicidality at the zero-order level. This relationship appeared to be explained primarily by Factor 3 (lifestyle/impulsivity), which, of all the facets in the PCL-R, was the only one that related significantly to suicidality. Partial correlations revealed that the relationships between the suicidality indices and Factor II (and Factor 3) were neither reduced nor increased by controlling for the other dimensions of the PCL-R.

The PPI total score was not significantly related to SRB, and was weakly related to suicide ideation. However, the PPI-I subscale was negatively related to both SRB and ideation, whereas the PPI-II subscale was positively related to both suicide indices (in both zero-order and partial correlational analyses). Finally, the PAI ANT scale was weakly related to SRB, and moderately related to suicide ideation. ANT-Egocentricity was not related to either outcome in partial correlational analyses; the ANT-Stimulation Seeking + Antisocial Behavior composite was related weakly to attempts, and somewhat more strongly related to ideation, in partial correlational analyses.

Mediation Analyses

Determining Independent Potential Mediators

We conducted a linear regression to determine which of the four[5] potential mediators (NE, low constraint, alcohol problems, drug problems) independently related to suicide ideation. All variables were entered as a single block, and produced a significant overall model, Mult $R = .62$, F (4, 561) = 87.53, $p \leq .001$. Two of the four variables were independently related to suicide ideation: NE ($\beta = .66$, $t = 16.62$, $p \leq .001$) and (low) constraint ($\beta = -.10$, $t = -2.77$, $p \leq .01$). Stepwise entry produced similar results.

We conducted a parallel logistic regression to determine which potential mediators were independently related to SRB. Again, we allowed all four potential mediators to enter the model, which produced a significant overall model, $-2LL = 520.764$, χ^2 ($N = 552$) = 46.86, Nagelkerke $R^2 = .13$, $p \leq .001$. Only NE had a significant independent relationship with SRB, B = .004, Wald = 25.21, $e^b = 1.004$, $p \leq .001$ (as before, results were similar using stepwise entry).

Mediational Analyses for Antisocial Personality Disorder

We conducted a series of hierarchical linear (with suicidal ideation as outcome) and logistic (with SRB as the outcome) regression analyses to test whether the relationship between ASPD and the suicide indices was mediated by NE and low constraint (for ideation) or just NE (attempts). We conducted these analyses first using the SCID as the measure of ASPD, and then again using the PDQ-4 as the measure of ASPD. For all analyses, following Baron and Kenny (1986), ASPD was entered directly in the first block of the analyses, and the hypothesized mediator(s) were entered in the second block. For all analyses, we used symptom counts of either the SCID or PDQ-4 as independent variables. As shown in Table 4, both the SCID and PDQ-4 produced significant models on the first step, for both suicide ideation and SRB. However, all effects of ASPD were completely mediated by both NE and (low) constraint (for ideation) and by NE (for attempts).[6]

Table 3 Correlations between measures of psychopathy and suicide-related behavior (SRB) and ideation

Psychopathy index	SRB		Suicide ideation	
	r or r_{pb}	Partial *r* or r_{pb}	*r* or r_{pb}	Partial *r* or r_{pb}
PCL-R total	.07[d]		.07	
Factor I	.02	.03	.00	−.07
Facet 1 (Interpersonal)	.04	.01	−.03	−.09[a]
Facet 2 (Affective)	.00	−.05	.03	.01
Factor II	.11[b]	.11[b]	.16[c]	.17[c]
Facet 3 (Impulsivity)	.14[c]	.15[c]	.16[c]	.17[c]
Facet 4 (Antisocial)	.03	−.02	.05	−.01
PPI Total	.03		.13[c]	
PPI-I	−.14[c]	−.13[c]	−.23[c]	−.22[c]
PPI-II	.14[c]	.14[c]	.33[c]	.33[c]
PAI ANT Total	.10[a]		.29[c]	
Egocentricity	.05	−.03	.20[c]	.04
Stim. Seek. + Ant. Beh.	.11[b]	.11[b]	.30[c]	.22[c]

Notes: [a] $p \leq .05$; [b] $p \leq .01$; [c] $p \leq .001$; [d] $p = .066$

N for PCL-R and suicide attempt range from 621 to 631 (partials from 616 to 624), and for suicide ideation, 570–580 (partials from 573 to 565). For PPI and suicide attempt, *N* ranges from 624 to 626 (for partials, 621), and for suicide ideation, 577–578 (for partials, 574). For PAI ANT and suicide attempt, $N = 578$ (for partials, $N = 574$–575), and for suicide ideation, $N = 593$ (for partials, $N = 589$–590). Details available upon request

As with the analyses of the SCID and PDQ-4, correlations with suicide ideation were not inflated due to PAI SUI being a continuous measure, in that they were comparable for a dichotomized index of PAI SUI (details available upon request)

Partial correlational analyses using the PCL-R facets control for all other facets

[5] Originally we had also included both the depression and borderline features scales from the PAI as potential mediators. However, we encountered substantial multicollinearity between these variables and NE (rs ≈ .90), which led to very high variance inflation factors and very low tolerances. Therefore, we could not obtain separable indicators for NE, depression, and borderline features for use in the same analysis. Given that NE is the overarching construct, and theoretically subsumes depression and borderline features, we chose to use NE and omit depression and borderline features from these analyses.

[6] The odds ratio derived from the logistic regression analyses (e^b) refers to the change in probability of observing the outcome event for each one-unit increase on the predictor, and hence must be gauged against this factor. For instance, NE, being derived from the first unrotated principal component of multiple PAI scales, has 593 steps or possible values. As such, an e^b of 1.005 (the e^b for NE in Table 4) must be exponentiated to arrive at the overall odds ratio (here, overall odds = $1.005^{593} = 19.25$).

Table 4 Mediational analyses for antisocial personality disorder

ASPD index/mediator		*N*	Step 1 (Enter ASPD)	Step 2 (Enter Mediators)	Suicide ideation model
A.	SCID symptoms/ Negative emotionality (Low) Constraint	545	$\beta = .16$ ($t = 3.81$, $p < .001$)	$\beta = -.02$ ($t = -0.48$, *ns*) $\beta = .66$ ($t = 17.26$, $p < .001$) $\beta = -.10$ ($t = -2.77$, $p < .01$)	1. *Mult* $R = .16$, $F = 14.49$, $p < .001$ 2. *Mult* $R = .62$, $F = 112.54$, $p < .001$
B.	PDQ-4 symptoms/ Negative emotionality (Low) Constraint	565	$\beta = .25$ ($t = 6.11$, $p < .001$)	$\beta = -.04$ ($t = -1.19$, *ns*) $\beta = .67$ ($t = 16.91$ $p < .001$) $\beta = -.10$ ($t = -2.76$, $p < .01$)	1. *Mult* $R = .25$, $F = 37.29$, $p < .001$ 2. *Mult* $R = .62$, $F = 117.33$, $p < .001$
ASPD index/mediator		*N*	Step 1 (Enter ASPD) B (Wald), e^b, p	Step 2 (Enter Mediator) B (Wald), e^b, p	Suicide attempt model
C.	SCID symptoms/ Negative emotionality	551	.132 (5.66), 1.141, $p < .05$	.013 (0.271), 1.032, *ns* .005 (36.04), 1.005, $p < .001$	1. $R^2 = .02$, $\chi^2 = 5.86$, $p < .02$ 2. $R^2 = .12$, $\chi^2 = 44.45$, $p < .001$
D.	PDQ-4 symptoms/ Negative emotionality	558	.075 (10.92), 1.077, $p < .01$	.011 (0.188), 1.011, *ns* .005 (31.17), 1.005, $p < .001$	1. $R^2 = .03$, $\chi^2 = 11.02$, $p < .001$ 2. $R^2 = .12$, $\chi^2 = 44.00$, $p < .001$

Table 5 Mediational analyses for psychopathy

Psychopathy index/mediator	*N*	Step 1 (Enter PCL-R Facet 3)	Step 2 (Enter mediators)	Suicide ideation model
PCL-R Facet 3/ Negative emotionality (Low) Constraint	565	$\beta = .16$ ($t = 3.95$, $p < .001$)	$\beta = .01$ ($t = 0.20$, *ns*) $\beta = .65$ ($t = 17.62$, $p < .001$) $\beta = -.10$ ($t = -2.81$, $p < .01$)	1. *Mult* $R = .16$, $F = 15.60$, $p < .001$ 2. *Mult* $R = .62$, $F = 116.59$, $p < .001$
PCL-R Facet 3/Mediator	*N*	Step 1 (Enter PCL-R Facet 3) B (Wald), e^b, p	Step 2 (Enter mediator) B (Wald), e^b, p	Suicide attempt model
PCL-R Facet 3/ Negative emotionality	561	.172 (11.66), 1.141, $p < .001$	.107 (4.088), 1.113, $p < .05$ .004 (34.49), 1.004, $p < .001$	1. $R^2 = .04$, $\chi^2 = 12.60$, $p < .001$ 2. $R^2 = .13$, $\chi^2 = 49.71$, $p < .001$

Notes: R^2 refers to Nagelkerke R^2

Mediational Analyses for Psychopathy

Next, we carried out a series of hierarchical linear and logistic regression analyses for the psychopathy measures (PCL-R and PPI) that paralleled those conducted for ASPD. For the PCL-R, we drew from the three-factor model for reasons outlined earlier, and used Factor 3 ("impulsive and irresponsible behavioral style," in Cooke and Michie's (2001) model) in analyses.[7] As shown in Table 5, Factor 3 was related to both suicide ideation and SRB in the first block of analyses. For ideation, its effect was completely mediated by both NE and (low) constraint. However, for SRB, it was not mediated by NE, but instead retained an independent relationship with SRB.

Finally, we provide a very brief summary of the relationship between the remaining psychopathy measures that demonstrated a consistent relationship with suicide outcomes in correlational analyses (PPI-I and II; PAI A + S—full details available upon request). For both the PPI and PAI A + S, significant effects (for both suicide ideation and SRB) on the first blocks of respective analyses were completely mediated. For the PPI, this was true whether PPI-I and II were entered together in a single block, or whether they were entered separately in different analyses.

Comparison of ASPD and Psychopathy

Mediation issues aside, we evaluated the independent contributions of ASPD and psychopathy to SRB by including them both in a series of hierarchical regression analyses. First, we tested the SCID symptom count and the PCL-R Factor 3 (the PCL-R index most strongly related to suicide outcome) with suicide ideation as the outcome,

[7] For purposes of replicating Verona et al. (2001), we also conducted analyses of the PCL-R two-factor model. PCL-R Factor II was predictive of both attempts and ideation in the first block of linear and logistic regression analyses, but its relationship with suicide ideation and SRB was completely mediated by NE and low constraint (the latter for ideation only).

entering the SCID as the first block, and then entering the PCL-R Factor 3 as block 2.

In this analysis, SCID-ASPD produced a significant model on step one ($R = .16$, F [1, 549] = 14.62, $p \leq .001$). PCL-R Factor 3 significantly, although slightly, increased the model's fit ($\Delta R^2 = .01$, ΔF [1, 548] = 5.42, $p \leq .05$). The final model was significant ($R = .19$, F [2, 548] = 10.08, $p \leq .001$), with both SCID-ASPD and PCL-R Factor 3 contributing roughly equally to the final model ($\beta_{SCID} = .11$, $t = 2.21$, $p \leq .05$; $\beta_{PCL\text{-}R} = .11$, $t = 2.33$, $p \leq .05$). The same final model was observed when the entry of the SCID and PCL-R was reversed.

Parallel logistic regression analyses were conducted using SRB as the outcome.[8] The SCID-ASPD produced a significant initial model (−2LL = 615.40, χ^2 [1, $N = 604$] = 5.89, $p \leq .01$, $e^b = 1.133$, Wald = 5.702, $p \leq .05$). Adding the PCL-R Factor 3 significantly improved the model fit (χ^2 [1, $N = 604$] = 6.61, $p \leq .01$) and only the PCL-R Factor 3 was significant in the final model (PCL-R $e^b = 1.152$, Wald = 6.424, $p \leq .01$; SCID $e^b = 1.045$, Wald = 0.505, *ns*), which itself remained significant (−2LL = 608.786, χ^2 [2, $N = 621$] = 12.50, $p \leq .01$, Nagelkerke $R^2 = .03$).

We also compared ASPD and psychopathy measured by the PPI (both Factors I and II, given that both PPI dimensions were significantly related to outcome in bivariate correlational analyses). With suicidal ideation as the outcome, SCID-ASPD again produced a significant model on step one ($R = .16$, F [1, 549] = 14.62, $p \leq .001$). Entering the two PPI factors significantly increased the model's fit ($\Delta R^2 = .13$, ΔF [2, 547] = 42.32, $p \leq .001$). The final model was significant ($R = .40$, F [3, 547] = 33.82, $p \leq .001$), and only the two PPI factors were significant in the final model ($\beta_{PPI\text{-}I} = -.22$, $t = -5.51$, $p \leq .001$; $\beta_{PPI\text{-}II} = .29$, $t = 6.56$, $p \leq .001$). Logistic regression analyses, using SRB as the outcome, produced the same pattern of findings (i.e., PPI-I and II were significant in the final model, whereas the SCID was not).

Finally, we conducted analyses that used the SCID-ASPD on block 1 and indices from each psychopathy measure on block 2 (PCL-R Factor 3; PPI-I and II; PAI ANT A + S) to test whether symptoms of psychopathy possessed incremental utility beyond symptoms of ASPD. With ideation as the dependent variable, the psychopathy measures improved upon the SCID-ASPD (no longer significant), $\Delta R^2 = .16$; ΔF (4, 555) = 26.88, $p < .0001$. The final model produced $R = .43$, $R^2 = .19$; Adj. $R^2 = .18$, F (5, 555) = 25.57, $p \leq .001$. Psychopathy indices that were significantly and independently related to ideation included: PPI-I ($\beta = -.28$, $t = -6.83$, $p \leq .001$), PPI-II ($\beta = .13$, $t = 2.30$, $p \leq .05$), and PAI ANT A + S ($\beta = .26$, $t = 4.30$, $p \leq .001$).

With attempts as the dependent variable, the psychopathy measures improved upon the SCID-ASPD (no longer significant), Block χ^2 [1, $N = 550$] = 25.61, $p \leq .001$). The final model produced a moderate effect size (Nagelkerke $R = .30$, $R^2 = .09$, −2LL = 532.341, χ^2 [5, $N = 550$] = 31.68, $p \leq .001$). Indices with significant independent contributions were PCL-R Factor 3 ($e^b = 1.14$, Wald = 4.40, $p \leq .05$) and PPI-I ($e^b = .54$, Wald = 13.80, $p \leq .001$).

Discussion

The findings from this study are consistent with previous research (Black 1998; Black and Braun 1998; Lester 1998; Verona et al. 2001) demonstrating an association between ASPD and suicidal behavior. Although replication has long been heralded as the key to science (Poincare 1905/2001), the current findings also extend prior work by investigating putative mediators of this association, assessing the role played by different dimensions and models of psychopathy, and applying multiple methods to do so. In bivariate analyses, ASPD related weakly, but significantly, to concurrent suicide ideation and past suicide-related behavior (SRB). However, these relationships were fully explained by negative emotionality (NE) and low constraint (the latter for ideation only).

Given the empirical and conceptual relationship between ASPD and psychopathy, we tested whether measures of psychopathy were related to suicidal behavior, and how ASPD and psychopathy fared when pitted against one another. In particular, we sought to replicate the work of Verona et al. (2001) by testing the relationship between the PCL-R and SRB and evaluating the mediational role played by NE and (low) constraint, as Verona et al. did, and to extend it by introducing substance use problems as potential mediators, an additional measure of suicidality (ideation), two additional measures and conceptualizations of psychopathy (PPI; PAI ANT), an additional psychopathy and ASPD measurement format (self-report), and newer models of PCL-R measured psychopathy.

Our findings were largely consistent with those of Verona et al. (2001). Although the full PCL-R score was not related to SRB, its more behavioral dimensions were—particularly the impulsive and irresponsible traits captured by Factor 3 (as opposed to Factor II). In addition, our finding of a small but reliable negative partial association between suicide ideation and the interpersonal facet of the PCL-R (i.e., after controlling for scores on the other PCL-R facets) converged with findings reported by Verona et al. (2005) for the interpersonal facet. Furthermore,

[8] SCID adult symptoms were used in analyses because SCID total symptoms were not significantly related to suicide attempts in bivariate analyses.

hierarchical regression analyses revealed that the significant relationship between PCL-R Factor II and suicidal outcome indices was completely mediated by personality trait variables, as in Verona et al. However, PCL-R Factor 3 remained significantly related to SRB. By also testing the four-factor model, we learned that Factor 4 was not significantly related to our outcomes.

Given that the behavioral indices of the PCL-R are strongly related to the externalizing spectrum of psychopathology (Patrick et al. 2005), which is itself related to suicidal behavior (Verona et al. 2004), one would expect, in theory, a positive relationship between such indices and suicidality. These finding suggest that understanding the relationship between PCL-R defined psychopathy and suicidality requires consideration of the traits underlying Factor 3, and not the criminal and antisocial behaviors indexed by Factor 4. Taken together, these findings suggest evidence of the enhanced construct validity of recently developed structural models of the PCL-R (in particular the three-factor model)—at least with respect to their 'behavioral' indices—that further refine its two primary dimensions (Cooke and Michie 2001).

Aside from the PCL-R, and to avoid a mono-method bias in the assessment of psychopathy, we also examined self-report measures of psychopathy. At the bivariate level, the PPI showed an interesting and theoretically meaningful bifurcated relationship to the suicide indices, in that PPI-I was inversely (protectively) related to suicidal indices, whereas PPI-II was positively related to suicidal indices. This finding was also observed for the two original factors of the PCL-R in a sample of female offenders (Verona et al. 2005), demonstrating cross-sample generalizability. However, in the present investigation of male offenders, the inverse relationship between PPI-I and suicidal indices was mediated by both NE and low constraint (ideation), or just NE (SRB), suggesting that the potential moderating role of gender requires further exploration.

In testing perhaps the most commonly used measures of antisocial and psychopathic personality, we observed that both the SCID-ASPD and PCL-R Factor 3 were uniquely associated with suicide ideation in (non-mediational) multivariate analyses, and that including them both in the model explained more variance in suicidal ideation than either did on its own. However, the PCL-R Factor 3 added incremental validity to SCID-ASPD in analyses of SRB, such that ASPD was no longer significant once Factor 3 was entered into the model. These findings suggest that PCL-R Factor 3 was more robustly associated with suicidal behavior than the DSM-IV conceptualization of ASPD. The fact that it retained an independent relationship to SRB even with NE in the model underscores this interpretation. As mentioned, the incremental validity of the PCL-R's Factor 3 over ASPD in the prediction of suicidal behavior could reflect the fact that this component of the PCL-R more directly indexes the broad externalizing factor of psychopathology (Patrick et al. 2005) that has been shown to predict suicidal behavior independently of internalizing (anxiety-depression) problems (Verona et al. 2004).

The aspect of the PCL-R that was related to suicidal indices in multivariate analyses—impulsive and irresponsible behavior—shares features with the DSM-IV operationalization of ASPD. Although suggesting that the PCL-R's measurement of these features is not isomorphic with ASPD, the findings showed that the more unique elements of psychopathy captured by the PCL-R (affective and interpersonal deficits) were essentially unrelated to suicidal indices. However, this was not the case with PPI-I which, when pitted directly against the SCID-ASPD, added incremental validity to the prediction of suicidal ideation and attempts. Both PPI-I and II were independently related (in different directions) to suicidal ideation (and PPI-I to attempts); the SCID-ASPD was rendered nonsignificant in these analyses.

Although PPI-I was not significant in mediational analyses, its inverse relationship to suicide ideation and attempts and its incremental validity above and beyond ASPD may provide evidence for models of psychopathy that emphasize interpersonal characteristics (i.e., social poise; grandiose sense of self-worth) that may buffer individuals against risk for suicidal behavior (Hare 1991; Skeem et al. 2003). In concert with other evidence for the value of these features in conceptualizing psychopathy (Patrick 2006), the present findings underscore the importance of considering these features as core elements of the psychopathy construct.

Further, in analyses using the SCID as a measure of ASPD and indices from each of the psychopathy measures, suicide ideation was predicted with considerable accuracy (Mult R = .47), and SRB with moderate strength (Mult R = .32). Notably, only measures of psychopathy contributed to these models above and beyond traditional suicide risk factors. For ideation, only indices from the self-report measures entered the analyses, underscoring the potential importance of using multiple measures. In these analyses, one behavioral index (PAI ANT A + S) and one index of affective psychopathic deficits (PPI-I—inversely) entered analyses. For actual SRB, PCL-R Factor 3 (Impulsive Lifestyle) and PPI-I (inversely) were associated with outcomes, underscoring the potential importance of using multiple methods. However, given that suicide ideation (based on self-report) was predicted only by other self-report measures, and SRB (interview and/or file extraction) was associated only with a clinically administered index (PCL-R Factor 3) one must consider method variance accounted for at least part of this pattern of effects. We note that the PPI-I also was related to attempts, suggesting

that method variance did not account exclusively for our findings.

These findings suggest a number of implications for clinical practice, although we advance these tentatively pending replication and further investigation. First, our findings suggest that high scores on measures of psychopathy—especially on aspects reflecting the more behavioral/impulsivity features—should not signal to clinicians that offenders are at *lower* risk for suicide, which clinical lore may suggest. This may be the most simple, though important, clinical implication of our current findings. Second, by using certain indices of ASPD and psychopathy measures, one can predict concurrent suicide ideation and postdict SRB reasonably well, and in a way that indicates both increased (i.e., PCL-R Factor 3) or decreased (i.e., PPI-I) risk. From a purely pragmatic perspective, this could aid in devoting risk reduction resources to offenders at higher risk than others. However, in all of our analyses, the relationship between ASPD and SRB was completely explained by other clinical risk factors (e.g., negative emotionality, low constraint). This finding suggests that, for specific intervention avenues, clinicians should assess these clinical risk factors for SRB and, when appropriate, target them in treatment to reduce risk of SRB. In contrast, the relationship between one indicator of psychopathy (PCL-R Factor 3) and SRB could not be entirely explained by these other clinical risk factors. This suggests that assessments and interventions that target impulsivity, poor behavior controls, and irresponsible behavior may reduce risk of SRB (see Linehan 1993). We also must issue a caveat that, because only one ASPD/psychopathy index was significant in mediational analyses, this effect could have arisen due to chance. Future research will be needed to determine whether this effect replicates in new samples.

Our investigation is marked by two primary limitations. First, it relied on a retrospective evaluation of SRB and a cross-sectional evaluation of suicidal ideation. A prospective study of SRB would provide a more robust test of the role of ASPD and psychopathy. Nevertheless, the present investigation contributes to the scant literature on serious self-harm among a population of high-risk offenders. This is a topic of considerable concern to those who must make decisions about, and work with, these offenders. Second, our measure of SRB was based on one question from a larger interview, although it was supplemented by file information (as it was in Verona et al. 2001). Ideally, we also would have gathered information about the recency, frequency, and severity of past SRB, and the intent that drove it. We recommend that these efforts be undertaken in future research. However, our methodology permits direct comparison to Verona et al. (2001).

Finally, the present study indicates the importance of using multiple assessment methods for psychopathy. Both clinician-administered and self-report measures contributed unique variance to the prediction of SRB. In fact, for ideation, only the self-report measures (one index from each) were significant in regression analyses, and together produced a large effect size, although these findings may be at least partly attributable to method covariance stemming from the reliance on self-report in both predictor and criterion. For SRB, one clinician-administered index and one self-report index contributed unique variance and jointly produced a moderate effect size. Our work therefore reinforces the need for further research on the incremental validity of alternative methods of detecting psychopathic personality traits (e.g., Lilienfeld and Fowler 2006).

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