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Is delusional ideation a critical link in the nexus between personality disorder and violent offending?

Abstract

Evidence suggests that consideration of personality disorder (PD) severity, incorporating both externalising and internalising features of PD, might help to clarify the PD - violence relationship; moreover, that separate developmental pathways might link externalising and internalising personality pathology with criminal violence. The present study of 96 forensic patients with confirmed PD and a history of violent offending addressed the question of whether delusional ideation, measured by the Peters Delusions Inventory (Peters et al., 1999), might play a significant role in the link between severe PD and criminal violence. Severe PD, defined by summing scores across DSM-IV PD criteria (American Psychiatric Association, 1994), was significantly associated with delusional thinking, with violence, and with high levels of both externalising and internalising personality features. Delusional thinking was associated with violence via internalising but not externalising PD features, suggesting that the link between severe PD and violence may be partly mediated by delusional thinking.

KEY WORDS: personality disorder; violence; borderline; antisocial; comorbidity.

Introduction

Despite a well-documented association between personality disorders (PDs) and violence (Yu, Geddes & Fazel, 2012), the nature of this link remains obscure (Duggan & Howard, 2009). Patients with PD show, in varying degrees, traits that are associated with disorders of affect/emotion, behaviour, and cognition. Therefore deficits in any of these domains, or in a combination of them, might account for the association with violence. Attention in the research literature has focussed mainly on deficits in behavioural or emotional self-regulation as being responsible for the link with aggression and violence (e.g. Newhill, Eack & Mulvey, 2012; Scott, Stepp & Pilkonis, 2014). Deficits in the cognitive domain, in particular delusional thinking, have been relatively neglected despite a large literature attesting to the link, on the one hand, between delusions and violence in a variety of other mental disorders (e.g. Keer, Ullrich, DeStavola & Coid, 2013) and, on the other hand, the well-documented presence of delusional thinking in a number of PDs, particularly borderline PD (Zanarini, Frankenburg, Wedig & Fitzmaurice, 2013) and paranoid PD (Bernstein & Useda, 2007). Patients with paranoid PD may experience transient psychotic-like symptoms under conditions of extreme stress (Miller, Useda, Trull et al. , 2001) and may hold unwarranted beliefs that are not always easy to distinguish from true delusions (Bernstein & Useda, 2007).

Borderline PD has been a particular focus in the study of delusional ideation. In a prospective study, Zanarini et al. (2013) compared a large sample of BPD patients with a smaller sample of patients whose PD did not include BPD but included other PDs from the dramatic and emotional cluster (cluster B). BPD patients were reported to show quasi-psychotic thought described as “relatively fleeting departures from reality” (Zanarini et al., 2013, p. 676). These disturbed cognitions declined substantially over time but remained a residual problem at 16 years follow-up. A majority of the control group of PD patients in this study did not meet full criteria for a PD diagnosis, and likely suffered from a less severe PD

than did the BPD group. This leaves unresolved the question of whether the greater degree of delusional thinking in Zanarini et al.'s BPD group might be attributable not to their clinical diagnosis but to the greater severity of their PD, as suggested by Hengartner et al. (2014). Our ability to evaluate the relative severity of PD in Zanarini et al.'s two groups is limited by their failure to report comorbidities with other PDs. This is problematic since, as outlined below, PD severity has been linked to a high degree of metacognitive deficits which would be expected to result in delusional thinking (Semerari et al., 2014).

Recent evidence from the Dunedin longitudinal study suggests that irrational thoughts, by contributing to a General Psychopathology (“p”) factor, likely pervade the entire spectrum of human psychopathology in its severest forms (Caspi et al., 2014). These authors emphasise that “...unwanted irrational thoughts are not just for the formal psychoses” (p.132). Echoing this, Freeman (2006) suggested that delusions are commonly found in the general (non-clinical) population, among individuals without psychosis. Approximately 1% to 3% of the non-clinical population were estimated to have delusions of a level of severity comparable to clinical cases of psychosis, with a further 5% to 6% having delusions of lesser severity that were nonetheless associated with a range of social and emotional difficulties. Freestone, Howard, Coid & Ullrich (2012) found a higher level of psychotic symptoms, including delusional ideation, among those in the general U.K. household survey in whom antisocial personality co-occurred with borderline PD than in those without this comorbidity. Antisocial/borderline co-occurrence was also associated with a broad spectrum of antisocial outcomes, including violence, and with the presence of co-morbid Axis I disorders, particularly severe childhood conduct disorder, drug/alcohol dependence, and anxiety disorder. Antisocial/borderline comorbidity has been found to be associated with a high degree of PD comorbidity in general, across the entire spectrum of DSM-IV PDs (Howard, Huband & Duggan, 2012), and with severe violence and both internalising and externalising

aspects of personality pathology in forensic psychiatric patients (Howard, Khalifa & Duggan, 2014).

Taken together, these findings suggest that antisocial/borderline comorbidity (and severe PD more generally) likely combines psychopathology across different but interrelated dimensions or spectra - internalizing, externalizing and psychotic experiences - that have been identified empirically both in psychiatric patients (e.g. Wright, Krueger, Hobbs, Markon, Eaton & Slade, 2013) and in community residents studied prospectively (Caspi et al., 2014). These results further suggest that antisocial/borderline comorbidity may be a marker for overall PD severity, indexed for example by summing across PD criteria. Measured in this way, PD severity has been found to transcend particular trait manifestations of PD in the prediction of overall psychosocial functioning and to be associated with co-occurring psychological disorders and heavy drug/alcohol use (Hopwood et al., 2011; Hengartner et al., 2014) and with deficits in metacognition (Semerari et al., 2014). Metacognitive deficits include an impaired ability of individuals to recognize the subjective nature of their thoughts and to achieve a critical distance when considering their beliefs, resulting in idiosyncratic interpretations of external reality. These would, as Semerari et al. pointed out, be perceived as bizarre by others and therefore labelled as delusional.

Severity of PD has not, to date, been investigated as a possible correlate of delusional thinking and of violence in forensic psychiatric patients with PD. In the community sample investigated prospectively by Caspi et al. (2014), three correlated factors -externalizing, internalizing and thought disorder - were all significantly associated with convictions for violence. However, externalising was associated with violence convictions independently of thought disorder, while “p” (largely comprising thought disorder) accounted for the association between internalising and violence. In the forensic/psychiatric sample investigated by Howard et al. (2014), patients with antisocial/borderline PD comorbidity

showed high levels of both internalising and externalising PD traits and – in comparison with other PD patients - a high degree of severe violence. These authors suggested that delusional thinking might account for the relationship between severity of PD and violent offending, but did not offer any evidence in support of this supposition.

The Current Study

Building on the previous results of Howard et al. (2014) and Caspi et al. (2014), the present study addressed the question of whether delusional ideation might play a significant role in linking PD with severe violence. First, it tested the hypothesis that severity of PD, defined either by ASPD/BPD comorbidity or by total PD symptom count summed across all PDs (Hopwood et al., 2011), would be associated with a high degree of delusional thinking, measured using the 21-item Peters Delusions Inventory (PDI: Peters et al., 2004: see Methods below). Secondly, it tested the hypothesis that delusional thinking would be linked with severe violence through its relationship with internalising personality pathology, but that – consistent with previous results from the Dunedin sample reported by Caspi et al. (2014) - any relationship found between externalising traits and violence would be independent of delusional thinking. Confirmation of this hypothesis would imply the existence of distinct pathways through which antisocial/borderline PD comorbidity (and PD severity more generally) may be linked to violence, only one of which would operate via delusional thinking and general psychopathology (p). An alternative pathway, from externalising personality pathology in childhood and adolescence to adult antisocial personality, is thought to be mediated by the effects of early alcohol and other drug misuse on adolescent brain development (see review by Howard & McMurrin (2013).

Methods

The Sample

Participants were included so long as they had at least one identifiable personality disorder meeting the DSM-IV (American Psychiatric Association, 1994) criteria and an absence of major mental illness. In order to ensure that the presence of delusional thinking was not attributable to the confounding effects of mental illness, patients presenting Axis I psychotic disorders or bipolar disorder were excluded using the computerized version of the National Institute of Mental Health Diagnostic Interview Schedule (C-DIS: Robins, Helzer, Cottler & Goldring, 1989). Patients with a history of epilepsy, head injury, or an IQ measuring less than 70 on the Wechsler Adult Intelligence Scale (Wechsler, 1997) were also excluded in order to ensure that any delusional ideation found in patients was not of organic origin or derived from impaired general cognitive ability. The final sample comprised 96 participants. They were male forensic patients recruited from personality disorder services across two English high secure hospitals (N = 55), a medium secure hospital (N = 31) and a community-based forensic service (N = 10). The mean number of offences committed by participants was 33.8 (SD = 35.1). Participants had convictions for a wide variety of violent offences including assault (52%), actual bodily harm (51%), sexual offence (32%), manslaughter (11%) murder or attempted murder (18%). The mean age of onset of their violent offending was 18.3 years (SD = 5.4).

Procedure

The study was approved by the relevant local Research Ethics Committee. Patients recruited into the study first underwent screening using C-DIS to ensure that they met the above-mentioned inclusion and exclusion criteria. Their case-notes were then examined to extract information about their offence history, including their history of violent offending, and other socio-demographic data. They then underwent the following assessments:

Assessment of Personality Disorder

The presence of personality disorder was assessed using the interview version of the IPDE, a 99-item semi-structured interview designed to assess the ten DSM-IV Axis II personality disorders and personality disorder not otherwise specified (Loranger et al,1994; Loranger, 1997). It has demonstrated good inter-rater reliability (dimensional scores -median ICC = .89, Loranger et al.,1994; categorical - kappa of 0.70 and above, Zimmerman, 1994) and temporal stability (median ICC = .79, Loranger et al. 1994). Individual IPDE items are scored on a three points scale (0=absent, 1=partially present, 2=definitely present) allowing dimensional scores to be derived for individual personality disorder categories. For 13 participants in the study kappa statistics were used following assessments carried out by an independent forensic psychiatrist to explore inter-rater reliability (kappa 0.72-0.83, $p < 0.005$).

In addition to DSM-IV PDs, assessed both categorically and dimensionally, factor scores were computed using the weighted sum score method (Distafano, Zhu & Mîndrilă, 2009) on two higher-order factors, “acting out” (externalising) and “anxious inhibited” (internalising), derived by Blackburn, Logan, Renwick & Donnelly (2005) from a primary factor analysis of 93 IPDE items. Twenty-one items contributed to the “acting out” factor, and 19 items to the “anxious inhibited” factor: see Table 1.

TABLE 1 HERE

Psychopathy was assessed using the Hare Psychopathy Checklist-Revised (Hare, 2003). The PCL-R guidelines were followed to rate each of the 20 PCL-R items; 0=definitely not present, 1=present to some extent or 2=definitely present. As well as obtaining a total score out of 40, scores on the 2 PCL-R factors (F1, selfish, callous & remorseless use of others; and F2, chronically unstable & antisocial lifestyle) were obtained. PCL-R ratings were based on both interview and reading of case files.

Assessment of Delusional Ideation

The 21-item PDI was used to measure the presence and severity of a broad range of delusional thinking. Based upon the Present State Examination (Wing, Cooper & Sartorius, 1974), PDI is a reliable and valid instrument that was developed to measure delusional ideation in the general population, i.e. it was not designed to identify full-blown psychotic delusions. It has been validated in samples of both healthy and psychotic individuals (Peters et al., 2004; Peters et al., 1999). The internal consistency ($\alpha = 0.82$), test-retest reliability ($r = .78 - .81, p < .0001$) are adequate, as are the convergent, criterion and discriminant validity (Peters et al., 2004). PDI yielded an overall endorsement score out of 21 reflecting the degree to which individual items were responded to in the affirmative (example of items: “Do you ever feel as if things in magazines or on TV were written especially for you?”, “Do you ever feel you are being persecuted in some way?”, “Do you ever feel that you are a very special or unusual person?”, “Do your thoughts ever feel alien to you in some way?”). If an individual item was endorsed, it was then rated for degree of conviction (“How true do you believe this to be?”) on a 5-point scale (1=“Don’t believe it is true, 5=“Believe it is absolutely true”), yielding a conviction score out of 105. For the purpose of the analysis and results described below, the individual’s conviction score was added to his endorsement score to yield a total PDI score for that individual, with a maximum possible score of 126. The internal consistency of this measure ($\alpha = 0.82$) was found to be equivalent to that previously reported for PDI by Peter’s et al. (2004). Additional dimensional scores for distress and preoccupation described by Peters et al. (2004) were not measured in the present study since these authors reported that the conviction score by itself was sufficient to differentiate a deluded group from a healthy, non-deluded group.

Assessment of Severe Violence

Severity of violence (SoV) was measured using a rating scale adapted from that originally developed by Gunn and Robertson (1976) and validated in hospitalised forensic patients by

Wong, Lumsden, Fenton and Fenwick (1993). SoV was based on the participant's history of violent convictions and indexed the degree of harm inflicted on his victims, rated on a 5-point scale ranging from 0 (= no violence) to 4 (= severe violence, e.g. victim died or life and health were seriously endangered). A selection of cases (n = 10) were used to calculate the interrater reliability of these ratings, which was deemed satisfactory with a kappa value of .70.

Data analytic strategy

Data analysis proceeded in two stages, consistent with the hypotheses being tested (see Introduction). First, we examined correlates of PD severity using a measure derived by Hopwood et al. (2011), namely the total IPDE dimensional symptom score summed across all DSM PD categories. Next correlational analysis was performed to investigate inter-relationships between severity of violence, IPDE factor scores (acting out and anxious inhibited) and PDI scores. Correlational analysis utilised either Pearsons or Spearman's rho depending on the normality of the variables. Finally, linear regression analysis was carried out using the step-wise entry method with the variables PDI, "anxious-inhibited" and "acting out" entered in all possible orders to identify whether these variables predicted severity of violence (SoV) as an outcome, controlling for age at first offence, a well-established correlate of violence (Stattin & Magnusson, 1996; Tolan & Gorman-Smith, 1998) as a covariate.

Results

Correlates of PD Severity

The PD severity score (Hopwood et al., 2011) correlated very highly with the ASPD/BPD dimensional score ($r = .87, p < .001$), indicating that ASPD/BPD comorbidity was a reasonable proxy for overall PD severity. PD severity also correlated significantly with both IPDE factors, "anxious inhibited ($r = .54, p < .001$) and "acting out" ($r = .64, p < .001$), and with PDI score ($r = .40, p < .001$). With the notable exception of schizoid PD, all individual

PD dimensional scores correlated significantly ($p < .01$) with PD severity, r 's ranging from .28 (obsessive-compulsive PD) to .72 (borderline PD). These correlations are comparable to, albeit somewhat lower than, those obtained by Hengartner et al. (2014), who likewise reported the highest correlation ($r = .85$) was between PD severity and BPD. PD severity correlated significantly with PCL-R total ($r = .30, p < .001$) and with both PCL-R Factor 1 ($r = .29, p < .05$) and Factor 2 ($r = .36, p < .01$). Finally, PD severity correlated significantly with severe violence (SoV: $r = .30, p < .01$) and with age of onset of violent offending ($r = -.25, p < .05$).

“Acting Out”, “Anxious-inhibited” and Delusional Ideation as Predictors of Violence.

Since, as reported above, PD severity was significantly correlated with both IPDE factors, “acting out” and “anxious-inhibited”, regression analyses using the step-wise entry method were undertaken to determine whether either or both IPDE factors, “acting out” and “anxious-inhibited”, might contribute to the prediction of severe violence, and whether the effects of either might be accounted for by delusional thinking. The variables PDI, “anxious-inhibited” and “acting out” were entered in all possible orders.

Results of multiple linear regression (hierarchical enter method) revealed that both ‘acting out’ ($\beta = 0.306, p = .002$) and ‘anxious inhibited’ ($\beta = 0.226, p = .021$) predicted SoV as an outcome, accounting for 14% of the variance ($F = 8.55; p < .0001$): see Table 2, Step 1. Total PDI also predicted SoV when modelled in isolation ($\beta = 0.297, p = .003$), but when PDI total was entered into the regression along with ‘acting out’ and ‘anxious inhibited’ (see Step 2 in Table 1), ‘anxious inhibited’ ceased to have a significant independent effect in predicting SoV ($\beta = 0.146, p = .156$). The final model (see Step 3 in Table 2) showed that delusional thinking ($\beta = 0.272, p = 0.006$) and ‘acting out’ ($\beta = 0.297, p = 0.003$) independently predicted SoV, accounting for 16.2% of the variance ($F = 10.003; p < .0001$). Multicollinearity was

considered acceptable given that ‘acting out’ did not significantly correlate with either ‘anxious inhibited’, nor delusional thinking ($r = .097$, $p = .36$; $r = .19$, $p = .07$ respectively); and the tolerance value was 0.987. In short, the results revealed that regardless of the order in which variables were entered, both “anxious-inhibited” and “acting out” significantly and independently contributed to the prediction of severe violence when entered singly or together. However, whenever PDI score was entered together with “anxious-inhibited”, the latter’s effect on severe violence was rendered non-significant, with PDI and “acting out” remaining as significant predictors.

TABLE 2 HERE

Discussion

When PD severity was operationalised by summing across PD criteria, it was associated with a high degree of delusional thinking, with a history (and early onset) of severely violent offending, and with both internalising and externalising features of personality disorder, as well as with a high degree of psychopathic traits as measured by the PCL-R. This last finding supports the idea that psychopathy as defined and measured by the PCL-R permeates DSM-IV PDs transdiagnostically (Blackburn (2005; 2009).

Regression analysis showed that the IPDE factors, “acting out” and “anxious-inhibited”, reflecting externalising and internalising personality pathology respectively (Blackburn et al., 2005), each significantly predicted severe violence in the criminal record, as did PDI score. However, when delusional thinking was entered into the regression equation together with “anxious-inhibited”, the latter ceased to contribute independently to the prediction of violence, leaving only “acting out” and PDI as significant predictors. This result implies that the relationship of “anxious-inhibited” with violence may have been mediated or moderated by delusional thinking. With the study being limited to cross-sectional, retrospective data it

was not possible to test a causal model in which delusional thinking might be shown to mediate the effects of internalising personality pathology on severe violence. Nonetheless, these results are compatible with such a causal model and consistent with results obtained by Caspi et al. (2014) in the Dunedin longitudinal study, where the association found between internalising psychopathology and convictions for violence was entirely accounted for by delusional thinking (“p”). Taken together with those of Caspi et al., the current results suggest the existence of separate pathways linking externalising and internalising features of severe PD with violence: an internalising pathway linked to violence via delusional thinking and general psychopathology, resulting – particularly in females (Martel, 2013) – from extremely high and/or inflexible levels of negative emotionality, empathy and rumination when experienced in the context of intense and/or chronic interpersonal stress during adolescence; and an externalising pathway leading from childhood conduct disorder through excessive use of alcohol in early adolescence - particularly in males with high levels of sensation-seeking and disinhibition who are driven to excessive alcohol use by a desire to seek novel and exciting experiences (Martel, 2013; Stautz & Cooper, 2013) - to adult antisocial personality (Freestone et al. 2012; Howard, Finn, Gallagher & Jose, 2012; Khalifa, Duggan, Lumsden, & Howard, 2012). These pathways are not, of course, mutually exclusive; both pathways would be expected to operate conjunctively in those with an end-point of severe PD (i.e. ASPD comorbid with BPD).

The current findings suggest that cognitive disturbance (thought disorder) is a prominent feature of severe PD considered transdiagnostically. This is consistent with recent evidence that severity of PD, regardless of its particular style of expression, is highly associated with metacognitive deficits, in particular an impaired ability to recognize the subjective nature of one’s own thoughts and thus to achieve a critical distance when considering one’s own beliefs (Semerari et al., 2014). A similar metacognitive/neurocognitive deficit has been

suggested by Howard & Duggan (2009) to characterise PD patients who, as a consequence of deficient error monitoring, are said to be unable to monitor and hence check unconventional and bizarre thoughts, feelings and actions. As a consequence they are predisposed to engage in both impulsive and premeditated violence.

Recent evidence suggests that delusions implying threat or harm to the individual are associated with angry affect, and that angry affect due to delusions mediates the latter's relationship with serious violence (Coid et al., 2013; Ullrich, Keers, & Coid, 2014). Given the extreme diagnostic heterogeneity both within and between the two samples studied by Coid et al. (2013) and Ullrich et al. (2014), it seems likely that some transdiagnostic factor accounts for their findings. The current findings suggest that internalising psychopathology is a likely candidate in this regard. Angry affect is characteristic of psychiatric disorders in which internalising psychopathology features prominently, including personality disorders such as BPD (see review by Howells, 2009). It therefore seems likely that angry affect resulting from threat-related delusional thinking may be a critical link in the pathway leading from internalising psychopathology to serious violence. Confirmation of this will, however, require further investigation, e.g. through an analysis of data such as that collected by Coid et al. (2013) and Ullrich et al. (2014) using higher-order dimensions of psychopathology, including internalising, as independent variables.

In agreement with previous findings (Hengartner et al., 2014), we found that, of all the PD categories, BPD had the strongest relationship with overall PD severity. This is consistent with the finding that of all DSM-IV/DSM-5 PDs, BPD is the only one that includes symptoms of dysfunction across the four domains of cognition, affectivity, interpersonal behaviour and impulse control (Bornstein, Bianucci, Fishman & Biars 2014). Our results have implications for findings of cognitive disturbance in BPD (e.g. Zanarini et al., 2013), suggesting that BPD patients' cognitive disturbance reflects the transdiagnostic severity of

their PD rather than any specific PD diagnosis. This seems particularly likely given the high degree of comorbidity of BPD with other PDs and with Axis I disorders (Howard et al., 2012; McGlashan et al., 2000).

Study Limitations

This study has a number of limitations, including, firstly, its small sample size and its forensic nature. Ideally the relationship between delusional thinking and PD would be studied across a much wider spectrum of PDs, in larger samples that included both forensic and non-forensic PD patients. Nonetheless, comprising as it did patients with confirmed PD who had been convicted of predominantly violent crimes, the sample studied here was well-suited to investigating relationships between PD and violence. Secondly, a differentiation between different types of violence in terms of its motivation, in addition to assessment of its severity, might have enabled more nuanced relationships to be discerned between personality disorder and violence. It might be, for example, that externalizing and internalizing tendencies are associated with motivationally distinct types of violence. A third, and serious, shortcoming of the present study concerns the postdictive, cross-sectional nature of its design. As pointed out by several authors (e.g. Patrick, Edens, Poythress, Lilienfeld & Benning 2006; Kennealy, Skeem, Walters & Camp, 2010), all postdictive studies in which previous criminal behaviour (in this case serious violence) is correlated with measures of antisocial personality (in this case PD severity) raise the possibility of criterion contamination. Moreover, there is likely to have been “procedural” criterion contamination, insofar as the investigator who carried out the assessment of PD was not blind to the history of violence when making ratings of PD, and indeed needed to know about this history in order to make these ratings. It would therefore be difficult, if not impossible, to demonstrate that criterion contamination was not a factor contributing to the pattern of associations between variables reported here. In view of

this, the current results should be taken as suggestive rather than definitive, and longitudinal studies will be required to confirm them.

Conclusion and Implications for PD Assessment and Treatment

Notwithstanding these limitations, results of this study suggest that PD associated with severely violent offending reflects disturbances across all three broad spectra of psychopathology - internalizing, externalizing and psychotic experiences - identified empirically by Wright et al. (2013) and Caspi et al. (2014); moreover, that cognitive disturbance, manifested in delusional thinking, might mediate the relationship between internalising personality pathology and violence. There is an increasing focus on PD severity, rather than PD category, in the assessment of PD, and much discussion about how best to operationalise severity (e.g. Hopwood et al., 2011). The forthcoming eleventh International Classification of Disorders (ICD-11) proposes abandoning PD categories in favour of a single severity dimension (Tyrer et al., 2011). The current results suggest that a satisfactory assessment of PD severity, one that includes serious risk of harm to others, will require assessment across all three domains of psychopathology – internalising, externalising, and thought disorder – in order to capture the full range of their severity. Finally, these results have implications for therapeutic intervention with patients with severe PD, suggesting that interventions which focus on enhancing the individual’s ability to think about mental states (e.g. mentalization-based treatment: Fonagy & Target, 2006; metacognitive interpersonal therapy: Dimaggio, Semerari, Carcione, Nicolò & Procacci (2007) might be most successfully applied in those cases with predominantly internalising personality pathology; they may be less successful for those with comorbid externalising features, e.g. co-occurring ASPD and BPD.

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Factor 1 “acting out”	Factor 2 “anxious inhibited”
APD7: Lack of remorse (.62) CD2: Initiated fights before age 15 (.62) CD4: Cruel to people before age 15 (.60) CD1: Often bullied others before age 15 (.60) APD2: Repeated lying (.51) APD4: Irritable and aggressive (.49) NAR7: Lacks empathy (.48) BOR4: Impulsivity (.45) CD12: Stole without confronting victim before age 15 (.45) NAR6: Exploitative (.44) BOR8: Inappropriate anger (.43) HIS6: Exaggerated emotion (.42) HIS8: Considers relationships intimate (.41) CD5: Cruel to animals before age 15 (.41) NAR5: Sense of entitlement (.39) NAR1: Grandiose self-importance (.39) HIS2: Sexually seductive (.36) CD6: Stole while confronting victim before 15 (.36) APD5: Reckless disregard for safety (.35) CD13: Often stayed out at night before 15 (.33) NAR4: Requires admiration (.32)	AVO5: Inhibited in new interpersonal situations (.68) AVO6: Views self as inept (.65) TYP1: Ideas of reference (.58) TYP9: Excessive social anxiety (.53) BOR7: Chronic emptiness (.51) BOR6: Affective instability (.50) AVO1: Avoids contact at work (.47) PAR2: Doubts loyalty or trustworthiness (.46) DEP4: Difficulty doing things on his own (.46) AVO7: Avoids personal risks (.45) TYP3: Unusual perceptual experiences (.45) BOR9: Paranoid ideation (.44) BOR5: Recurrent suicidal gestures (.41) PAR3: Reluctant to confide (.39) DEP1: Needs reassurance (.38) CD15: Often truant at school (.38) TYP5: Suspiciousness (.36) SCH5: Lacks close friends (.34) PAR1: Suspects exploitation or harm (.33)

Table 1. : IPDE items contributing to the “acting out” and “anxious inhibited” IPDE factors described by Blackburn et al. (2005). Factor loadings are in brackets. Abbreviations (with their corresponding IPDE dimensional item numbers) refer to the following DSM-IV Axis I/Axis II disorders: APD: antisocial personality disorder; BOR: borderline personality

disorder; CD: childhood conduct disorder; HIS; histrionic personality disorder; NAR: narcissistic personality disorder; AVO: avoidant personality disorder; TYP: schizotypal personality disorder; PAR: paranoid personality disorder; DEP: dependent personality disorder.

Models	Adjusted R Squared	F	Predictors	β	t	Sig.	Collinearity Statistics	
							Tolerance	VIF
Step 1	.140	8.552	(Constant)	-	3.374	.001		
			“Acting Out”	.306	3.169	.002	.991	1.009
			“Anxious Inhibited”	.226	2.344	.021	.991	1.009
Step 2	.172	7.426	(Constant)	-	3.174	.002		
			“Acting Out”	.289	3.041	.003	.984	1.016
			“Anxious Inhibited”	.146	1.429	.156	.854	1.170
			PDI Total	.217	2.124	.036	.851	1.175
Step 3	.162	10.003	(Constant)	-	4.217	.000		
			“Acting Out”	.297	3.110	.003	.987	1.013
			PDI Total	.272	2.843	.006	.987	1.013

Table 2. Results of multiple regression analysis, using SoV as the dependent variable.

