Psychopathy and Self-injurious Thoughts and Behaviour: Application of Latent Class

Analysis

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Abstract

Background: Although early conceptualisations posited an inverse relationship between psychopathy and self-injury, little research has tested this. **Aims:** To examine the self-injurious thoughts and behaviour associated with psychopathy. **Method:** Data from the MacArthur Violence Risk Assessment Project were used to examine homogenous subtypes of participants based on their responses to six self-injury items. A binary logistic regression model was used to interpret the nature of the latent classes by estimating the associations with the four psychopathy factors, mixed anxiety-depression, violence victimisation, and gender. **Results:** A 2-class solution provided the best fit to the data. Most participants (86.2%) were assigned to the baseline ('low self-injury risk') group. 'The high-risk self-injury group' was characterised by a higher probability of endorsing all self-injury items, particularly 'thoughts of hurting self' and 'attempts to hurt self'. The four psychopathy factors showed differential associations with self-injury group membership. Participants scorings higher on the affective component and lower on interpersonal component of psychopathy, were significantly more likely to be assigned to the high risk group. Significant associations were also found between mixed anxiety/depression and gender, and 'high-risk self-injury group' membership. **Conclusions:** These findings have important implications for the identification of individuals at risk of self-injury.

Keywords: Psychopathy, Self-injury, Self-injurious Behaviour, Latent Class Analysis

Introduction

Psychopathy is a clinical construct characterised by a constellation of interpersonal (e.g., deceitfulness, superficial grandiosity, and superficial charm), affective (e.g., lack of empathy, remorse, or guilt), and behavioural (e.g., irresponsibility, impulsivity, manipulative) features (Cleckley, 1976; Hare, 2003; Hare & Neumann, 2008). Early conceptualisations of psychopathy posited an inverse relationship between psychopathy and suicidal behaviour (Cleckley, 1976). However, little empirical research examining the relationship between the specific features of psychopathy and self-injurious thoughts and behaviour (with and without suicidal intent) exists.

The international standard for the assessment of psychopathy is the Psychopathy Checklist-Revised (PCL-R; Hare, 1991, 2003) and its derivatives: the Psychopathy Checklist: Screening Version (PCL: SV; Hart, Cox, & Hare, 1995) and the Psychopathy Checklist: Youth Version (PCL: YV; Forth, Kosson, & Hare, 2003). Traditionally, the PCL instruments have been viewed as encompassing two correlated but distinct factors (Harpur, Hare, & Hakstian, 1989); Factor 1 items reflect the affective and interpersonal features of psychopathy; Factor 2 items reflect the antisocial and deviant lifestyle features of psychopathy. Although the factors are moderately correlated, they are differentially related to personality and behavioural constructs. Of particular note, Factor 2 is significantly correlated with Antisocial Personality Disorder (APD; Hare, Hart, & Harpur, 1991), which itself has been found to significantly relate to self-injurious thoughts and behaviour (e.g., Verona, Patrick, & Joiner, 2001). Moreover, PCL-R antisocial-lifestyle traits are positively related to reactive violence (Patrick, Zempolich, & Levenston, 1997) and to substance misuse – both of which are known correlates of suicidality (Verona & Patrick, 2000). Recently, the four-factor solution of psychopathy (interpersonal, affective, antisocial, and lifestyle factors) has

received increasing support (e.g., Hill, Neumann, & Rogers, 2004), and is, consequently, the focus of the present research.

Psychopathic traits and Self-injurious behaviour

Verona, Patrick, and Joiner (2001) found that suicide attempt history was significantly positively related to PCL-R Factor 2 (antisocial-lifestyle features), but unrelated to Factor 1 (affective-interpersonal features), in a sample of 313 male prison inmates. This finding was consistent with previous research linking suicide attempts to antisocial behaviour (e.g., Nock & Kessler, 2006) but inconsistent with Cleckley's (1976) assertion that psychopathy is negatively associated with suicidal behaviour. In addition, Verona and colleagues (2001) reported that high negative emotionality and low levels of constraint (or impulsivity) mediated the relationship between Factor 2 and suicidality. Similarly, Verona, Hicks, and Patrick (2005) found that antisocial-lifestyle factor scores were positively associated with a history of suicide attempts, in a sample of 226 female prison offenders. However, in contrast to Verona et al.'s (2001) study, but consistent with Cleckley's (1976) assertion that psychopaths are relatively immune to suicidal behaviour, interpersonal-affective factor scores exhibited a significant negative relationship with attempt history. Moreover, the negative relationship between attempt history and interpersonal-affective factor scores was accounted for mostly by the interpersonal, and not the affective features of psychopathy, when examining the relationship between attempt history and the four factors of psychopathy.

Verona and colleagues'(2001) findings were also replicated by Douglas, Herbozo, Poythress, Belfrage, and Edens (2006) in a multi-sample investigation of 1,711 forensic patients, criminal offenders, psychiatric patients, and justice-involved youths. Using multiple measures of both psychopathy and suicidal thoughts and behaviour, and combining 12 samples to obtain grand mean correlations, a significant positive relationship between

antisocial-lifestyle scores and suicidal behaviour was found. No significant relationship

between interpersonal-affective scores and suicidal behaviour existed, when controlling for

antisocial-lifestyle scores.

More recent research has extended this work further by testing a four-factor model of

psychopathy and examining the specific features of psychopathy that account for the suicide-

related behaviour –psychopathy association. Douglas, Lilienfeld, Skeem, Poythress, Edens,

and Patrick (2008) reported that the Factor 2 (in the two-factor model) contribution to

suicide-related behaviour was largely due to the lifestyle, as opposed to antisocial traits of

psychopathy, in a sample of 682 male offenders. Using the same data set as we use in the

present research, Swogger, Conner, Meldrum, and Caine (2009) reported that the antisocial

features of psychopathy (Factor 4) were significantly associated with suicide attempts when

controlling for age, gender, and race. None of the psychopathy factors were, however,

associated with non-suicidal self-injury.

Violence victimisation, mixed anxiety/depression, and self-injurious behaviour

Considerable evidence exists that childhood maltreatment and sexual abuse are statistically

significant, although general and non-specific, risk factors for non-suicidal self-injury and

suicide (Maniglio, 2011; O'Connor, Rasmussen, Miles, & Hawton, 2009). Research has also

consistently identified significant relationships between both anxiety and depression, and

self-injurious behaviour without lethal intent (e.g., Nock & Kessler, 2006), and irrespective

of intent (e.g., O'Connor, et al., 2009).

Aims

The main aim of the present study was to examine the relationship between psychopathy and

self-injurious thoughts and behaviour in a large sample of civil psychiatric patients. More

specifically, the present research aimed to examine the relationships between the four psychopathy factors and items indexing self-injurious thought and behaviour in this population, when controlling for mixed anxiety-depression, violence victimisation, and gender. Based on previous findings of an inverse relationship between suicide attempts and interpersonal-affective factor (Verona, et al., 2005) and the possibility that emotional experience deficits (Patrick, 1994) might protect psychopathic individuals from the emotional states commonly associated with self-injurious behaviour (with and without suicidal intent; see Klonsky, 2007), we hypothesised that the affective features of psychopathy would be significantly negatively associated a self-injury history. Finally, based upon previous findings linking PCL-R Factor 2 and suicide-related behaviour (Verona, et al., 2004), we hypothesised a significant positive relationship between the antisocial and lifestyle factors of psychopathy (Factors 3 and 4 in four-factor model) and endorsement of self-injurious thoughts and behaviour.

Method

Sample

As described in more detail elsewhere (Monahan et al., 2001), participants were 1,136 civil psychiatric patients sampled from one of three acute inpatient hospitals as part of the MacArthur Violence Risk Assessment Study. Participants were included in the study if they, (a) were between the ages of 18–40, (b) spoke English as a primary language, (c) had been hospitalised for less than 21 days, and (d) had a diagnosis, based on medical records, of schizophrenia, schizophreniform disorder, schizoaffective disorder, major depression, dysthymia, mania, brief reactive psychosis, delusional disorder, alcohol or other drug abuse or dependence, or a personality disorder. After excluding data from participants who were not administered both the Hare Psychopathy Checklist: Screening Version (PCL: SV) and

measures of self-injurious behaviour, we were left with a sample of $N = 871$ (502 males and

369 females) for analysis. Participants in this sample were between the ages of 18–40 ($M =$

29.86, $SD = 6.20$).

Measures

Psychopathy – Psychopathy was assessed by trained raters using the 12 –item Psychopathy

Checklist-Screening Version (PCL: SV; Hart et al., 1995), based on a semi-structured

interview, supplemented by a review of file information. Each item is rated on a 3-point scale

(0 = *does not apply*, 1 = *applies to a certain extent*, 2 = *applies*). The PCL: SV has good

reliability and validity, and is strongly related to the PCL-R, both conceptually and

empirically (Cooke, Michie, Hart, & Hare, 1999).

Self-injurious thoughts and behaviour - Six items were used to assess self-injurious

behaviour. Specifically, participants were asked whether they had: 1) thoughts of hurting

themselves in the past two months, 2) attempted to hurt themselves in the past two months, 3)

self-injured when alone, 4) acted to gain help during or after self-harm, 5) made any final acts

in anticipation of death (e.g., will, gifts, insurance), and 6) written a self-harm note. Items

were dummy coded.

Violence victimisation – The specific questions used to assess violence victimisation in the

present research are referred to in the MacArthur code book as Violence Screen #1. The eight

items ask whether the respondent has been the victim of aggression/violence in terms of

having been: slapped, pushed/grabbed/shoved, on the receiving end of something thrown at

them, hit with a fist/object, kicked/bitten/choked, injured by a knife/gun, sexually abused

(tried to force them to have sex against their will), and threatened with a weapon. A summed

score (Violence victimisation) of all items was used for the analysis given that they reflect a

superordinate factor.

Mixed anxiety/depression - Mixed anxiety/depression was assessed using the Anxiety-

Depression subscale of the 18-item Brief Psychiatric Rating Scale (BPRS; Overall &

Gorham, 1962).

Analysis

Latent class analysis (LCA) is a statistical method used to identify homogeneous groups (or

classes) from categorical multivariate data. In current research, LCA was employed to

determine the number and the nature of self-injury risk groups based on the endorsement of

six items reflecting the latent construct of self-injury. The six self-injury items were dummy

coded. Three latent class models were tested (a one- through to a three-class latent class

model). Selection of the optimal number of latent classes was based on several statistical fit

indices. The statistical fit indices were: likelihood ratio chi-square (LR χ^2), Akaike

information criterion (AIC), Bayesian information criterion (BIC), sample size adjusted BIC

(SSABIC), the Lo-Mendell- Rubin's adjusted likelihood ration test (LRT), and entropy

measures. A non-significant LR χ^2 indicates acceptable model fit. The information statistics

AIC, BIC, and SSABIC are goodness of fit measures used to compare competing models;

lower observed values indicate better fit. The LRT statistic was used to compare models with

differing numbers of latent classes; a non-significant value ($p < .05$) suggests that the model

with one fewer class should be accepted. Entropy is a standardised measure of how

accurately participants are classified. Values range from 0 to 1 with higher values indicating

better classification.

Logistic regression was used to assess the association between class membership

(posterior probabilities from the model were used to assign individuals to a class) and

psychopathy (four subscales), being a victim of violence, mixed anxiety/depression, and

gender. The subsequent odd ratios (OR) indicate the expected increase/decrease in the

likelihood of scoring positively on a given variable compared to the reference, or control

group (in this case low self-injury risk group). The LCA was conducted using Mplus 6.12

(Muthén & Muthén, 1998-2010).

Results

Table 1 reports descriptive statistics and internal consistency (Cronbach's alpha) for the four psychopathy factors, violence victimisation, and mixed anxiety/depression.

[Insert Table 1 about here]

Table 2 presents the endorsement rates for each of the six self-injury items for the entire sample after list-wise deletion of missing data. There is a certain degree of variability in endorsement rates for all items. Acts in anticipation of death (0.9%), self-injury note (1.1%), self-intervention (4.1%), and isolation (4.5%) criteria were met by a relatively small percentage of the sample. The thought of hurting self (42%) and attempt to hurt self (13.8%) criteria were met by a larger proportion of the sample.

[Insert Table 2 about here]

The fit indices for alternative latent class analyses are presented in Table 3. The 2-class solution is considered to be the best model; LR χ^2 is non-significant and the information statistic (BIC) is markedly lower than in the 1 and 3 class solution. Most importantly, Lo-Mendell-Rubin's LRT indicates that the 3 class model is not significantly better than the 2 class model, therefore the 2 class solution is preferred on the basis of parsimony. The entropy value (1.00) indicates excellent classification of participants.

Class 2 (the 'Low-Risk Self-injury' class) was the substantially larger class (86.2% of participants) and was characterised by zero probability of endorsing any of the self-injury items, with the exception of thought of hurting self (item 1 – probability of .33). This class was considered to be the baseline (normative) group. Class 1 (the 'High-risk self-injury' class; 13.8%) was characterised by a higher probability of endorsing all self-injury items,

particularly the thought of hurting self (item 1 – probability of 1) and attempts to hurt self (item 2 – probability of 1).

[Insert Table 3 about here]

Table 4 reports the results from the logistic regression that was used to assess the association between self-injury class membership and the four psychopathy factors, violence victimisation, mixed anxiety/depression, and gender. Significant associations were found between 'High-risk self-injury' class membership (compared to 'Low-Risk Self-injury' class membership) and 2 subscales of psychopathy (interpersonal OR = .84; affective OR = 1.27). These results indicate that participants scoring higher on the affective component of psychopathy, and lower on the interpersonal component of psychopathy, were more likely to be assigned to higher risk group (class 1). Similarly, a significant positive association was found between mixed anxiety/depression and 'Low-Risk Self-injury' class membership (OR = 1.11). Moreover, members of the 'high-risk self-injury' risk group were significantly less likely to be male (OR = .45).

[Insert Table 4 about here]

Discussion

The current study aimed to examine the relationship between self-injury risk group membership (identified via latent class analysis) and the four psychopathy factors, when controlling for mixed anxiety-depression, violence victimisation, and gender. The study is particularly relevant given the high rates, and clinical importance, of self-injurious behaviour (Nock, 2010). Two distinct latent classes emerged in the analysis with only a small percentage of participants (13.8%) clustering in the 'high risk self-injury class' (class 1). Participants in this class were characterised by higher probability of endorsing all self-injury items, particularly thoughts of hurting self and attempts to hurt self.

Inconsistent with the first hypothesis, results indicate that participants with higher scores on the affective component of psychopathy (i.e., those with less remorse, empathy, and willingness to accept responsibility for their own behaviour) were significantly more likely to be assigned to the 'high risk self-injury class'. One possible explanation for this finding is that the emotional detachment/lack of feeling indexed by this factor (Patrick, 1994) may lead to less anticipatory anxiety about inflicting harm on oneself, and a greater willingness to engage in self-injurious behaviour for instrumental purposes (i.e., to manipulate others or gain access to some valued resource). This is consistent with Porter and Woodworth's (2006) and Cleckley's (1941) suggestion that psychopathic individuals engage in a substantial amount of self-injurious behaviour that is intended solely to manipulate others (which, according to Porter and Woodhouse, would be more consistent with higher affective factor scores). Additionally, it suggests that the self-injurious behaviour reported by psychopaths may be different to that of others, which is typically associated with the experience of aversive negative affect (Klonsky, 2007; Nock & Prinstein, 2005).

Also contrary to expectations, the antisocial and lifestyle features of psychopathy (Factors 3 and 4 respectively; i.e., poor impulsivity, lacking goals, irresponsibility and poor behavioural controls, adolescent and adult antisocial behaviour, respectively) were not significantly associated with 'high risk self-injury class' group membership. This is inconsistent with previous research findings of a significant positive relationship between antisocial and suicide-related behaviours (e.g., Kimonis et al., 2010; Verona, et al., 2004). However, items assessing self-injurious thoughts and behaviour, with and without suicidal intent, formed the basis of the items used for the latent class analysis, as opposed to items purely indexing suicide attempts. Replicating the findings of Verona et al. (2005), results indicate that individuals scoring lower on interpersonal component of psychopathy (i.e., those who are more superficial, grandiose, and deceitful) were less likely to be assigned to the 'high risk self-injury class'. This supports the suggestion that the interpersonal features of psychopathy may confer protection from self-injurious thoughts and behaviour.

No significant association was found between 'high risk self-injury class' membership and violence victimisation. Although this conflicts with some findings, several recent meta-analyses suggest a relatively limited impact of abuse history on psychopathological outcomes (e.g., Rind, Tromovitch, & Bauserman, 1998). Moreover, different forms of maltreatment have been found to make different contributions to the prediction of psychopathological outcomes (Egeland, Yates, Appleyard, & Van Dulmen, 2002), and the measure used in the present study incorporated a range of violent experiences. A significant positive association between mixed anxiety-depression and class 1 membership was found. This is consistent with previous research documenting an association between anxiety and depression and self-injurious behaviour with and without lethal intent (e.g., Nock & Kessler, 2006; O'Connor, et al., 2009).

Important strengths of the present study include the large sample, use of a well-established measure of psychopathy, and the analysis of the relationship between the four components of psychopathy and items indexing self-injurious thoughts and behaviour. Most importantly, however, the present research used a statistical technique that did not rely on the inappropriate (given the fact that items did not form an internally reliable scale) use of total self-injury scores or the construction of a latent self-injurious thoughts and behaviour variable. Instead, participants were classified into self-injury risk groups (two, in this case), for the subsequent logistic regression, based on the probability of endorsing each self-injury item. Nonetheless, certain limitations should be acknowledged. First, data on self-injury, violence victimisation, and mixed anxiety-depression were based on retrospective self-reports, which introduces the possibility of recall bias in the data, as well as inaccurate symptom reporting (either over- or under-reporting). Second, as a consequence of the cross-sectional nature of the data, it is not possible to establish the timeline between violence victimisation, mixed anxiety-depression, psychopathy emergence, and self-injurious thoughts and behaviour. Finally, participants in the present study were treated psychiatric patients, and therefore, the findings may not generalise to other populations.

In future research, it would be interesting to examine the relationship between the four-factors of psychopathy and self-injurious behaviour performed with and without suicidal intent, as a growing body of work suggests that non-suicidal self-injury, or the deliberate destruction of body tissue without explicit intent to die, is related to, but distinct from, ideation /attempts (Nock, 2010). As information was not available on the functions served by self-injurious behaviour among individuals high on the affective factor, it is not possible to identify the reasons *why* psychopathic individuals experience self-injurious thoughts and behaviour. An important direction for future research, therefore, would be the examination of

the extent to which self-injurious behaviour is performed for intra- and inter-personal

functions (Nock & Prinstein, 2005) among psychopathic individuals.

The present study has a number of important clinical implications. First, the presence

of psychopathic traits should not be taken as exclusionary criteria for undertaking a risk

assessment or lead to the dismissal of the possibility of self-injurious thoughts and behaviour.

Indeed, the results indicate that individuals scoring highly on the affective component of

psychopathy (Factor 2) may be significantly more likely experience self-injurious thoughts

and behaviour, as indicated with a greater likelihood of class 1 membership. Although in the

present research, the results did not suggest a relationship between the antisocial-lifestyle

features and self-injury, health care professionals should not dismiss the possibility of self-

injury risk, as previous research (e.g., Verona et al., 2005) observed significant positive

relationships between these psychopathic traits and suicidality.

In conclusion, this study found that the four psychopathy factors differentially relate

to self-injury group membership, when controlling for mixed anxiety-depression, violence

victimisation, and gender. Specifically, participants scorings higher on the affective

component and lower on interpersonal component of psychopathy, were significantly more

likely to be assigned to the higher risk group. This suggest that health care professionals

should follow commonly accepted practices in the assessment of self-injury/suicide risk, and

justifies the investigation of psychopathic traits, and not just antisocial deviance per se, as

potential predictors of self-injurious thoughts and behaviour in future research.

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Table 1

Descriptive Statistics and internal consistency for psychopathy, violence victimisation, and mixed anxiety/depression.

Variable	M	SD	Minimum	Maximum	Cronbach's α
PCL1 (Interpersonal)	1.41	1.60	0	6	.72
PCL2 (Affective)	1.70	1.69	0	6	.77
PCL3 (Lifestyle)	2.93	1.86	0	6	.76
PCL4 (Antisocial)	2.47	1.84	0	6	.74
Violence victimisation	.91	1.53	0	8	.76
Anxiety/Depression	10.49	5.15	1	26	.70

Table 2

Prevalence rates of self-injury items

Item	Criteria endorsed count (%)
Thought of hurting self	366 (42.0)
Attempt to hurt self	120 (13.8)
Acts in anticipation of death	8 (0.9)
Self-harm note	10 (1.1)
Self-intervention	36 (4.1)
Isolation	39 (4.5)

Table 3

Fit indices for the latent class analysis of self-injury

Model	LR χ^2 (df)	p	AIC	BIC	SSABIC	LRT	p	Entropy
1 class	564.94 (54)	.00	2714.14	2742.76	2723.70	---	---	---
2 classes	41.03 (50)	.81	2099.86	**2161.87**	2120.59	615.29	.00	1.00
3 classes	12.94 (43)	1.00	2085.77	2181.17	2117.65	27.51	.06	1.00

Note: LR χ^2 = likelihood ratio chi-square, AIC = Akaike information criterion, BIC = Bayesian information criterion, SSABIC = sample size adjusted BIC, LRT = Lo-Mendell-Rubin's adjusted likelihood ratio test.

Table 4

Associations between self-injury classes, psychopathy, gender, violence, and mixed anxiety/depression

Variable	B	SE	OR (95% CI)
PCL1 (Interpersonal)	-.18	.09	.84* (.72/.97)
PCL2 (Affective)	.24	.09	1.27*** (1.10/1.48)
PCL3 (Lifestyle)	.07	.07	1.07 (.95/1.21)
PCL4 (Antisocial)	-.05	.07	.96 (.85/1.07)
Gender (1 = males)	-.80	.21	.45*** (.32/.64)
Violence victimisation	.08	.06	1.09 (.98/1.20)
Anxiety/Depression	.10	.02	1.11*** (1.07/1.14)

Note. Reference group: low self-injury risk group, B = estimate, SE = Standard Error, OR = Odds

Ratio, 95% CI = Confidence Interval. * p < .05; ** p < .01; *** p < .001