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Evans, Laura, Ioannou, Maria and Hammond, Laura

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A Predictive Model of Criminality in Civil Psychiatric Populations

Laura Evans, Maria Ioannou and Laura Hammond

University of Huddersfield

Purpose – This study sought to develop a predictive model of criminal risk in civil psychiatric populations, by determining the relative impacts of 1) psychopathy, 2) drug use, 3) impulsivity and 4) intelligence on levels of criminality.

Design/methodology/approach - The sample consisted of 871 civil psychiatric patients, selected from the MacArthur Violence Risk Assessment Study, who had been diagnosed with a mental illness or personality disorder, and hospitalised less than 21 days. Each participant was administered the Hare Psychopathy Checklist Screening Version (PCL:SV), Barratt Impulsiveness Scale (BIS-11), and the Wechsler Adult Intelligence Scale (WAIS-R). In addition, information on background demographics, drug use and criminality was obtained via a self-report questionnaire.

Findings - Pearson correlations identified significant positive relationships between past arrests, psychopathy, impulsivity, and drug use. Intelligence was negatively related to past arrests. Multiple regression identified a significant main effect for Factor 2 psychopathy on past arrests when controlling for all covariates, but not for Factor 1 psychopathy, intelligence or impulsivity. Drug use and gender had small univariate effects.

Research limitations/implications - It is suggested that future research investigates the influence of specific mental disorders on different types of offending.

Originality/value – By investigating predictors of criminal behaviour in civil psychiatric patients, the present study makes valuable contributions to the research literature, enhancing our theoretical understanding of the relationships between psychopathy and criminality/recidivism. It also has notable implications in applied practice, for example; in the development and refinement of risk assessment methods.

Keywords: Psychopathy, Criminal Behaviour, Intelligence, Impulsivity, Recidivism

Introduction

An abundance of literature has focused on the aetiology of criminal behaviour and recidivism. A number of demographic attributes and key risk factors, ranging from age, race and socioeconomic status to intellectual functioning and criminogenic needs, have been found to impact upon offending behaviour (Gendreau, Little & Goggin, 1996). However, one of the strongest predictors consistently associated with increased criminal behaviour and recidivism is psychopathy (Hemphill, Hare & Wong, 1998; Hare, Clark, Grann & Thornton, 2000) (see Dhingra and Bodusezek, 2013 for a review). The present study sought to evaluate the nature and extent of the impact that psychopathy and its associated traits/behavioural manifestations have on levels of criminality and likelihood of recidivism for civil psychiatric patients.

Psychopathy and Criminality

Features of psychopathy predispose an individual to behavioural deviancies (Viding, Frick & Promin, 2007; Vitacco, Michael, Neumann & Wodushek, 2008), and these tend to be related to increases in offending (Hare, 1991) and higher rates of recidivism (Hemphill et al., 1998). Serin and Amos (1995) found that psychopathic offenders were five times more likely to offend than non-psychopathic offenders while Harris, Rice and Cormier (1991) found nearly 80% of psychopathic offenders committed a new violent offence within a year of being released from prison.

The prevalence of significant associations reported in these studies indicates that psychopathy is indeed a strong predictor of recidivism. However, in order to further understand the relationship between psychopathy and criminal behaviour/recidivism, it is necessary to explore the underlying factor structure of the construct. There is an on-going

debate within the literature over whether psychopathy can be explained as a single, two-factor, three-factor or even four-factor model (Hare & Neumann, 2008). Whilst there is no clear consensus on the most appropriate factor structure, the strongly correlated two factor model ($r = .80$; Hare, 1991) is still commonly referred to, despite the more recent four factor model receiving increasing support within the literature. The two factor structure represents the core interpersonal and behavioural traits of psychopathy. Both factors are based on Cleckley's (1941) model of personality, and provide the theoretical underpinning for the Hare Psychopathy Checklist Revised (PCL-R; Hare). Factor 1 reflects the interpersonal and affective traits expressed through psychopathy, including callousness, deceitfulness, remorselessness and egocentricity, whilst Factor 2 focuses on socially deviant behaviours such as impulsivity and irresponsibility.

Whilst both Factor 1 and Factor 2 psychopathy have been found to be significantly associated with violent offending (Harpur & Hare, 1991), research has consistently indicated that Factor 2 of the PCL-R is a stronger predictor of recidivism than Factor 1 (Walters, Knight, Grann & Dahle, 2008; Hemphill et al., 1998; Beggs & Grace, 2008). It has also been shown to be positively associated with greater number of prior convictions (Heinzen, Kohler, Godt, Geiger & Huchzermeier (2011). Conversely, Factor 1 has been found to be only weakly correlated with general and violent recidivism, and is associated with lower conviction rates (Walters et al., 2003).

It is likely that the strength of the relationship between psychopathy (i.e. scores on Factor 1 and Factor 2) and criminal behaviour will be influenced by the cognitive and behavioural attributes associated with psychopathy, such as low intelligence (Gendreau et al., 1996) and substance abuse (Hopelle & Brunelle, 2012). As such, these factors need to be taken into account when deriving models of the predictive relationship between psychopathy and criminal propensity, in order to enhance their reliability and validity.

Intelligence and Criminality

The notion that lower intelligence is related to criminal behaviour goes back decades (Goddard, 1920), and has received consistent empirical support from the criminological literature (Hirschi & Hindeland, 1977). Gendreau et al. (1996) conducted a meta-analysis of 132 studies (N = 21,369) and found that intelligence was a stronger predictor of recidivism than class or race, an association shown to hold across age, gender and ethnicity (Rushton & Templar, 2009). Guay, Ouimet & Prolux (2005) attempt to explicate this relationship by arguing that intelligence is indirectly linked to offending through its effect on mediating factors such as social adaptation and opportunities for success. Guay et al. also argue that individuals with lower intelligence are predisposed to criminal behaviour as they lack the relevant cognitive abilities needed to evaluate the consequences of their actions and acknowledge the suffering of others - traits typically associated with psychopathic personalities. Bate, Boduszek, Dhingra and Bale (2014) offer an alternative view, arguing that the relationship between intelligence, psychopathy and emotional response may lead to criminal behaviour. Bate et al. found that lower levels of intelligence were positively associated with Factor 2 psychopathy scores and emotional responsiveness. They argued that greater propensity for emotional arousal may lead individuals to seek out highly stimulating situations to compensate for reduced levels of internal stimulation. As a result, such a sensation may lead to increased involvement in criminal offences.

Recent research has begun to consider in more detail the manifestation of different psychopathic traits results in variations of intelligence in psychopathic individuals by using versions of the Weschler Adult Intelligent Scale (WAIS; Weschler, 1981), a more sophisticated measure of intelligence than the IQ measures previously employed. The WAIS provides a comprehensive assessment of intelligence with subscales measuring verbal comprehension, working memory, perceptual organization and processing speed, which is

more appropriate than IQ when considering the multi-faceted structure of psychopathy. This, when used in conjunction with measures of psychopathy (such as PCL-R Factor 1 and Factor 2 scores), offers a means of more reliably evaluating the mediating effect(s) that intelligence has on the relationship between psychopathy and criminality.

The studies of Vitacco et al. (2005) and Tribolet-Hardy, Volis, Mokros & Mednick, (2013) both find strong positive correlations between verbal intelligence and interpersonal and affective traits as measured by Factor 1 of the PCL-R. Although the association found by Tribolet-Hardy et al. was not statistically significant, their results imply that verbal intelligence is a necessary precursor to manipulative behaviour and superficial charm. Negative associations have been found between spatial intelligence and Factor 2 of the PCL-R (Salekin, Neumann & Leistico, 2004), suggesting that psychopathic individuals whose traits manifest in anti-social behaviours have impairments in spatial intelligence. Raine, Yaralian, Reynolds, Venables and Mednick (2003) argue that this can interfere with attachment processes and emotion recognition during formative years, predisposing an individual to anti-social behaviour.

Impulsivity, Drug Use and Criminality

The manifestation of impulsivity among psychopathic individuals has been suggested to be associated with increased risk of drug use and substance abuse. Base rates of drug and alcohol use are greater among psychopaths than non-psychopaths (Edens & McDermott, 2011), although both are more prevalent in those scoring highly on Factor 2 in both community and incarcerated samples (Taylor & Lang, 2006). There is also some evidence for a link between interpersonal and affective traits, represented by Factor 1, and greater cocaine dependency (Walsh, Allen & Kosson, 2007).

Increased drug use among psychopathic individuals can be explained by Gray's (1987) Reinforcement Sensitivity Theory. Gray argued that behaviour is guided by our behavioural action system (BAS) and behavioural inhibition system (BIS). Our BAS controls and regulates our approach behaviours whilst the BIS is responsible for withdrawal behaviours. Both systems are thought to be associated with substance use and psychopathy (Simon & Arens, 2007), with Factor 1 of the PCL-R associated with a weak BIS, and Factor 2 associated with a strong BAS (Wallace, Malterer & Newmann, 2009). Corr (2010) explained that psychopathy has been theorised as a dysfunction in BIS activity, which leads to cognitive inflexibility and deficits in response modulation as well as an increase in BAS activity, which results in impulsivity. This was supported by Hopley & Brunelle (2012), who found that psychopathy scores were strongly and positively related to impulsivity, as well as opiod, stimulant and hallucinogen dependence.

Drug-use has, in and of itself, been found to be positively associated with criminality; increased drug-use tends to be associated with an increased risk of involvement in criminal activity and increased risk of criminal recidivism (Scott et al., 1998). As such, there are clear risk factors for criminal behaviour, both direct and indirect, stemming from psychopathic tendencies and traits, associated impulsivity manifestations and drug-use patterns. The challenge for research now, then, is to determine the relative influence of each and establish their predictive values as risk determinants for criminality, both in isolation and combination.

Criminality in Civil Psychiatric Populations

A major limitation to the research into the links between psychopathy and crime presented thus far relates to the nature of the samples typically employed and consequent limits in the ecological validity of findings. Much of the literature examining predictors of criminal behaviour has utilised samples of primarily male offenders who have spent time in

the criminal justice system, either as prisoners or forensic psychiatric patients. In the case of psychopathy specifically, the prevalence of the disorder is known to be considerably higher in offending populations (25%; Hart et al., 1995) than it is in civil psychiatric populations (8%; Hart et al., 1995). As such, results from research utilising such samples are likely to be somewhat biased and misrepresentative of the true nature of the general relationship between psychopathy and crime.

At present, our understanding of the ways and extents to which the various factors identified might be predictive of criminal behaviour in other samples, such as civil psychiatric patients, is limited. What is therefore needed is more detailed empirical examination of the relationships between predictors such as psychopathy, intelligence, impulsivity, drug-taking and levels of criminality and criminal recidivism in non-offending samples (Tribolet-Hardy et al., 2013). This would enable the utility and validity of current violent risk assessments tools to be addressed, and potential revisions implemented where necessary.

Predicting and Assessing Risk in Psychiatric Patients

The violent risk assessment of psychiatric patients is a central feature of clinical practice, used to identify the danger posed by individuals to themselves or others (Steadman et al., 2000). However the predictive ability of psychopathy and its related traits covered thus far in assessing likelihood of criminal involvement in psychiatric patients remains unclear.

Based on the strength of the relationship between psychopathy and recidivism observed for offender populations, Monahan and Steadman (1994) suggest that psychopathy might be a general, common risk factor for crime amongst people with a mental illness. This proposition can be tested using a revised version of the PCL-R. The PCL-R was devised specifically for use in forensic populations and is resource intensive; it relies heavily on

information regarding previous offenses. In 1995, Hart and his colleagues devised a secondary measure to assess psychopathy in non-offending populations, the Psychopathy Checklist Screening Version (PCL:SV). The PCL:SV is similar to the PCL-R in terms of structure, and relationships with other variables and scores are strongly associated with that of the original measure (Hart et al., 1995).

Douglas et al., (1999) were the first to assess the ability of the PCL:SV to predict violence in civil psychiatric patients. Using a cut-off score of 8 to define psychopathy, Douglas and his colleagues found that involuntarily patients who scored above this were five times more likely to commit a violent offence after discharge. Skeem and Mulvey (2001) extended these findings with a more detailed analysis of the relationship between specific elements of the PCL:SV and criminality, finding that while Factor 2 of the PCL:SV was effective offending risk predictor, Factor 1 had little predictive power.

However, these studies failed to disentangle the relative influence of different psychopathic attributes in determining the predictive power of PCL:SV as a risk assessment tool within civil psychiatric patients, and the potential influence of personal attributes and psychopathic behavioural manifestations were not considered in any detail. As such, our understanding of the links between psychopathy and criminal behaviour in civil psychiatric samples remains limited.

The Present Study

The present study examined the impact of psychopathy and its associated traits on offending and criminal recidivism rates in a civil psychiatric population. This was with the aim of establishing a model of the main effects of Type 1 and Type 2 psychopathy on

patterns of criminality and criminal risk, and of the mediating effects of intelligence, impulsivity and drug-taking.

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. A total of 1,695 patients met the inclusion criteria, of whom 71% agreed to participate.

After excluding data from participants who were not administered the Hare Psychopathy Checklist: Screening Version (PCL: SV) 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 ($M = 29.86$, $SD = 6.20$).

Procedure

Participants were administered a baseline interview in the hospital and follow-up interviews in the community at approximately 10-week intervals.

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 was administered to all available participants during the first or second follow-up sessions. 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; Guy & Douglas, 2006). Consistent with recent research (Guy & Douglas, 2006; Hill, et al., 2004; Swogger, et al., 2009), PCL: SV is a multidimensional measure with two factors: Factor 1 (interpersonal - affective) and Factor 2 (antisocial lifestyle).

Impulsivity - The Barratt Impulsiveness Scale (BIS-11; Patton et al., 1995) is a questionnaire designed to assess the personality/behavioral construct of impulsiveness. It is composed of 30 items describing common impulsive or non-impulsive (for reverse scored items) behaviours and preferences. Items are scored on a 4-point scale (Rarely/Never = 1; Occasionally = 2; Often = 3; Almost Always/Always = 4)

Intelligence - The Vocabulary subscale of the WAIS-R was used as a measure of general intellectual ability since it has the best individual correlation with WAIS-R Full Scale IQ

(Wechsler, 1981). The task was administered and scored in its standardized format (Wechsler, 1981).

Demographic Questionnaire: A demographic questionnaire was administered to gather information on marital status, age, sex, number of days per week of any drug usage, and number of arrests in past two years.

Results

Descriptive Statistics

Descriptive statistics are presented in Table 1. As can be seen, the average age of participants was around 30 years ($M = 29.86$; $S.D. = 6.20$). They exhibited low-moderate levels of psychopathy, as indicated by the mean scores of 3.11 ($S.D. = 2.99$) and 5.41 ($S.D. = 3.30$) on the Psychopathy Checklist Factors 1 and 2 respectively. The standard deviation indicates there was a small amount of variability in the sample for both scores, with the variance in scores for Factor 2 slightly greater ($SD=3.30$) than Factor 1 ($S.D. = 2.99$). Intelligence scores varied widely and ranged between 0 and 70 ($M = 34.63$; $S.D. = 16.61$). Participants also exhibited a high level of variability in impulsivity scores, ranging between 8 and 107 ($M = 57.38$; $S.D. = 16.91$). The maximum number of arrests within the past two years was five; however the average ($M = .69$, $S.D. = 1.21$) indicates low levels of recidivism. Similarly, drug use within the sample was low ($M = .75$, $S.D. = 1.82$).

INSERT TABLE 1 HERE

Inter-Variable Correlations

The intercorrelations among all variables were investigated using Pearson's product-moment correlation coefficient (Table 2). Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity and homoscedasticity.

Results revealed that age had a weak, negative correlation with impulsivity, $r = -.10$, $p < .01$ and very weak, negative correlations ($p < .05$) with drug use, $r = -.07$, and prior arrests, $r = -.08$. In addition, age had a weak, positive correlation with intelligence, $r = .09$, $p < .01$. No significant correlations were found with either Factor on the Psychopathy Checklist.

Number of arrests in the past two years had a moderate, positive correlation with PCL Factor 2, $r = .44$, $p < .01$ and weak, positive correlations ($p < .01$) with Factor 1, $r = .28$, drug use, $r = .25$, and impulsivity, $r = .19$ indicating that a higher number of prior arrests is associated with increased psychopathy levels, drug use, and impulsivity. A weak, negative correlation was found between prior arrests and intelligence, $r = -.15$, $p < .01$, with increased number of prior arrests associated with lower intelligence.

Psychopathy was positively correlated with drug use, $r = .28$, $p < .01$ (Factor 1) and $r = .17$, $p < .01$ (Factor 2) and impulsivity $r = .15$, $p < .01$ (Factor 1) and $r = .36$, $p < .01$ (Factor 2) while a weak negative correlation was found between psychopathy and intelligence $r = -.18$, $p < .01$ (Factor 1) and $r = -.27$, $p < .01$ (Factor 2) indicating that increased psychopathy levels are associated with increased drug use and impulsivity, and lower intelligence scores.

Impulsivity was found to have a weak positive correlation with drug use, $r = .18$, $p < .01$ and a weak, negative correlation with intelligence, $r = -.20$, $p < .01$. Finally a weak, negative correlation was found between intelligence and drug use, $r = -.12$, $p < .01$.

INSERT TABLE 2 HERE

Multiple Regression

A multiple regression was performed to investigate the ability of psychopathy, drug use, intelligence and impulsivity to predict criminal behaviour, as measured by number of arrests in the past two years, while controlling for any possible effects of age, sex, and marital status. Preliminary analyses were carried out and confirmed that assumptions of normality, linearity and homoscedasticity were met.

Correlations of all predictor variables were examined (Table 3). All correlations were weak to moderate, ranging between $r = -.12, p < .01$ and $r = .57, p < .01$, indicating that there was no multicollinearity within the model. In addition, all predictor variables were significantly correlated with number of prior arrests, indicating that the data was suitably correlated with the dependant variable for the use of multiple regression to be both viable and useful.

As no a priori hypotheses had been made to determine the order of entry of the predictor variables, a direct method was used for the multiple linear regression analysis. The overall model ($F(8, 688) = 25.54, p < .001$) accounted for 23% of the variance in number of past arrests. The only significant predictors of recidivism were PCL:SV Factor 2, ($\beta = .35, p < .01$), drug use ($\beta = .12, p < .01$) and gender ($\beta = .11, p < .01$). PCL Factor 1, intelligence, impulsivity, age, and marital status were not statistically significant predictor variables for number of past arrests. The results indicate a significant main effect of the behavioural features of psychopathy on number of past arrests when all covariates are controlled.

INSERT TABLE 3 HERE

Discussion

The present study sought to examine the impact of psychopathy and its associated traits of offending and criminal recidivism rates in a civil psychiatric population. A detailed and thorough understanding the risk factors for criminal behaviour in civil psychiatric patients is of considerable value, from both a theoretical perspective – in understanding the root causes of criminality, and for practical and applied purposes – for example; in assessing risk. The analyses presented here offer a basis for the derivation of a predictive model of criminal behaviour (both of risk of committing crime and risk of criminal recidivism) for civil psychiatric populations.

The predictive abilities of psychopathy (Type 1 and Type 2), intelligence, impulsivity and drug use to assess criminal risk were assessed in detail, and it was found that Factor 2 on the PCL:SV was a stronger predictor of criminal behaviour than Factor 1. Factor 2 also had the strongest relationship with number of prior arrests. These findings accord with previous research in both psychiatric and forensic populations (Walters et al., 2008; Hemphill et al., 1998; Beggs & Grace. 2008; Heinzen et al., 2011; Douglas et al., 1999), and are reflective of the items encompassed within Factor 2 which index anti-social and criminal behaviour

A positive relationship was found between Factor 1 and number of arrests. However, when other factors were controlled for as part of the regression model this effect disappeared. This suggests that interpersonal and affective traits as represented by Factor 1 are only predictive of criminal behaviour when they are integrated with anti-social behaviours represented by Factor 2.

Impulsivity was not found to be a reliable predictor of recidivism within civil psychiatric patients. This is interesting, given that impulsivity was found to be significantly related to prior arrests, and also moderately related to Factor 2 of the PCL:SV. Whilst previous research has implied impulsivity is predictive of criminal behaviour as a by product of Factor 2 of the PCL:SV (Tribolet-Hardy et al., 2013), little research actually examines the predictive validity of impulsivity alone. It may be that previous results are biased as levels of impulsivity are higher amongst offenders (Rushton & Templar, 2009) or that impulsivity only contributes to criminal behaviour when it occurs alongside other socially deviant elements of psychopathy.

Drug use was found to be significant predictor of criminal behaviour within the model, in line with the findings of Scott et al., (1998) for sample of forensic psychiatric patients. The present study also illustrated that drug use was positively related to both Factors of the PCL:SV, which is also consistent with previous findings (Edens & McDermott, 2011). There was a slightly stronger relationship between Factor 2 and drug use than Factor 1, which might be explicated by the fact that drug use is more commonly associated with anti-social characteristics (Taylor & Lang, 2006).

While findings indicate that intelligence may be a negative predictor of criminal behaviour, this result failed to reach statistical significance. Previous research (Tribolet-Hardy et al., 2013; Vitacco et al., 2005) found verbal intelligence to be positively associated with Factor 1 of the PCL:SV, something that was not observed in the present study. This implies that verbal intelligence is not necessary to engage in manipulative behaviour, as might be assumed. Instead, intelligence was found to be negatively related to both Factor 1 and Factor 2. Similarly to impulsivity, it may be that low intelligence is only predictive of criminal behaviour when it associated with psychopathy. Future research should look to consider the influence of spatial intelligence, as well as verbal intelligence, as this will

provide a more comprehensive understanding on the predictive ability of intelligence as a complete construct.

With regard to demographic factors, age was found to be negatively related to number of prior arrests yet failed to act as a significant predictor in the regression model. Although a weak negative correlation was found between age and both factors of the PCL:SV, these were not significant. This suggests that, when considered in conjunction with psychopathy, age does not impact significantly upon offending risk. Gender was also found to be a significant predictor of criminal behaviour, with male psychiatric patients being more likely to offend than their female counterparts. Previous research has identified gender as a potential risk factor for violence, as conviction and recidivism rates for women are lower than they are for men (Monahan & Steadman, 1994). However, differences in overall psychopathy scores across males and females tend to be small and are rarely statistically significant (Nicholls, Ogloff, Brink & Spidel, 2005), although females often score higher on Factor 1 and lower on Factor 2 (Sutton, Vitale & Newman, 2002). It may be that, when considered in relation to psychopathy, males are more at risk of future offending than women because they tend to display more of the anti-social behavioural characteristics associated with the condition.

Strengths and Limitations

One of the strengths of the present study is the large sample size, meaning that results can be generalized to a wider population of civil psychiatric patients. However, as only voluntary patients were included, caution must be exercised when generalising findings to involuntary psychiatric patients. There is evidence that involuntary patients have a broader history of “dangerous acts” compared to voluntarily patients and therefore pose more of a risk (Rubin & Mills, 1983). Further; the prevalence of criminal behaviour in the sample was low, which may be due to the fact that voluntarily admitted patients are less likely to offend (Rubin & Mills). It may be that factors such as impulsivity and intelligence failed to predict

future offending because they were not strong risk factors for the present sample. Future research should consider utilising a sample of involuntarily psychiatric patients to understand whether the same risk factors apply to more dangerous patients.

A secondary limitation is the operationalization of future criminal behaviour. Using number of prior arrests to measure criminal behaviour is flawed as it fails to identify whether the conviction was of a violent, sexual or other nature, all of which have different risk factors. Low intelligence, for example, has been found to predict sexual recidivism more so than violent recidivism (Beggs & Grace, 2008). It would be beneficial to classify type of conviction alongside the measure of prior arrests in order to understand relationship between the variables for different type of offending.

Finally, the regression model used implies that the influence of particular risk factors on potential criminal behaviour is uniform across all individuals within a civil psychiatric population. Different disorders have very different characteristics, so future research should consider the validity of this model with regards to specific disorders. This will help to build a framework of how best to manage offending in psychiatric populations.

Conclusion

Present findings suggest that, in contrast to findings from previous research conducted on offender samples, impulsivity and intelligence fail to predict criminal behaviour in a civil psychiatric sample unless they are considered alongside psychopathy. This has notable implications for risk assessment in psychiatric institutions as results suggest that, given its ability to predict offending behaviour of civil psychiatric patients, psychopathy should be integrated into the risk assessment and management for all psychiatric patients. The model proposed here offers the practitioner or practitioner valuable insights into how, in what ways, and to what extent different background characteristics, psychopathic tendencies and

attributes might combine in order to increase offending risk. As such, it offers a means of deriving informed estimates of offending potential in any psychiatric population.

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Table 1

Descriptive statistics

Variable	M	SD	Min	Max
PCL - Factor 1	3.11	2.99	0	12
PCL - Factor 2	5.41	3.30	0	12
How many days per week do you typically use any drugs	.75	1.82	0	7
Age	29.86	6.20	18	40
Intelligence scale	34.63	16.61	0	70
Impulsivity scale	57.38	16.91	8	107
Number of arrests in past 2 years	.68	1.21	0	5

Table 2*Correlations between all continuous variables*

Variable	1	2	3	4	5	6
1. PCL - Factor 1	---					
2. PCL - Factor 2	.57**	---				
3. How many days per week do you typically use any drugs	.17**	.28**	---			
4. Age	-.05	-.01	-.07*	---		
5. Intelligence scale	-.18**	-.27**	-.12**	.09**	---	
6. Impulsivity scale	.15**	.36**	.18**	-.10**	-.20**	---
7. Number of arrests in past 2 years	.28**	.44**	.25**	-.08*	-.15**	.19**

Note: * $p < .05$; ** $p < .01$

Table 3

Relationship between number of arrests in past two years and psychopathy, intelligence, impulsivity and drugs' usage while controlling for demographics.

Variable	B	SE	β
PCL - Factor 1	.012	.017	.03
PCL - Factor 2	.129	.017	.35**
How many days per week do you typically use any drugs	.080	.023	.12**
Age	-.012	.007	-.06
Sex (Male = 1)	.277	.085	.11**
Marital status (ever married = 1)	.037	.089	.02
Intelligence scale	-.002	.003	-.03
Impulsivity scale	.002	.003	.02

Note: DV = number of arrests in past two years

* $p < .05$; ** $p < .01$