

# The impact of psychopathy on violence among the household population of Great Britain

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## Abstract

**Background** The public health impact of psychopathy on violence has not previously been measured in the general population.

**Methods** Psychopathy was measured using the Psychopathy Checklist:Screening Version (PCL:SV) in adults 16–74 years ( $n = 638$ ) in households in England, Scotland and Wales in a two-phase survey which included self-reported measures of violence.

**Results** Participants with PCL:SV scores 11 or above demonstrated a prevalence of 2.1% (95% CI 1.2, 3.8) but accounted for 18.7% of violent incidents, a population-attributable risk of 16.6%, and demonstrated an exponential rise in reported violent incidents. Psychopathic traits correlated with victim injury, multiple victim subtypes and locations.

**Conclusions** Psychopathy makes a substantial impact on violence among the general population despite a low prevalence. Explanations of this association include interpersonal difficulties due to psychopathic traits, fearlessness, thrill seeking, and antisocial lifestyle, but not impulsivity independent of antisocial lifestyle.

**Keywords** Psychopathy · Violence · Public health · Population survey

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## Introduction

Psychopathy is characterised by major affective deficit associated with multiple social and behavioural problems [1] and has strong links with aggression. Experimental studies suggest mechanisms to explain these associations, including thrill seeking, sadism, fearlessness, and the symptoms of psychopathy, specifically lack of remorse, poor anger control, impulsivity, and violence as part of an antisocial lifestyle [2]. However, associations between psychopathy and violence at the population level remain unclear. Self-reported violent behaviour is demonstrated to have a similar, high base-rate in both the UK and USA associated with demographic factors of male gender, younger age, lower socioeconomic status, and psychiatric morbidity, predominantly substance misuse and antisocial personality disorder [3–8]. Psychopathy is a rare condition with a prevalence of less than 1% in the British household population [9]. This suggests that its contribution to the overall level of violence in a population should be small, although this has not been previously quantified. Psychopathic traits demonstrate a quasi-continuous distribution in the general population [9] and most persons have no psychopathic traits. But those with traits could be at increased risk of violent behaviour. Representative population samples could demonstrate different associations with violence from those previously reported among selected, experimental samples of violent offenders.

The aim of this study was to examine the distribution of psychopathic traits and self-reported violent behaviour, elucidate their correlates, and estimate the contribution of psychopathy to violence among the population of Great Britain in a two-phase survey of a representative sample of adults in households aged 16–74 years, conducted in 2000. We used the PCL:SV to examine the relationship between

measures of psychopathy and self-reported violent behaviour over the past 5 years.

## Method

We examined the effects of psychopathic traits, self-reported violent incidents and their severity, indicated by injuries sustained by victims or the respondents themselves, the versatility of respondents' violent behaviour measured by the number of different types of victim and repetitiveness over a 5-year study period in a survey of a representative sample of adults aged 16–74 years in households in England, Wales, and Scotland (Britain), conducted in 2000. We also examined the impact of psychopathy on violent behaviour using the population-attributable risk (PAR). Psychopathy was measured using continuous total scores, scores on the four facets, [1] or subcomponents of psychopathy, and as a categorical entity using cut-off scores.

## Sample

This was a two-phase survey of psychiatric morbidity among adults aged 16–74 years living in private households in England, Wales and Scotland, which has previously been described [10]. In brief, 8,886 (69.5%) selected adults completed a first phase computer-assisted interview.

In the second phase, 1,036 subjects were selected on the basis of a screening process for psychosis and personality disorder and 638 (61.6%) agreed to participate and were interviewed. Second phase attrition rate (38.4%) was mostly due to refusals. Compared to respondents, they were more likely to be non-white (8.5 vs. 2.9%,  $p = 0.001$ ), with no educational qualifications (39.7 vs. 31.0%,  $p = 0.004$ ), less likely to have a university degree (9.7 vs. 16.0%,  $p = 0.004$ ), of lower social class (31.3 vs. 22.2%,  $p = 0.000$ ), and more likely living in rented accommodation (43.1 vs. 33.9%,  $p = 0.003$ ). Other background factors, including age, gender, legal marital status, employment status and family type, were similar between participants and non-respondents.

## Diagnostic measures

The sifting procedure to select subjects for the second phase has been described in a technical report of the survey [11]. Probable cases of personality disorder were identified in Phase I using the screening questionnaire of the Structured Clinical Interview for Axis-II Disorder (SCID-II) [12]. Subjects entered “yes” or “no” responses to 116

questions on laptop computer. Axis-II disorder categories were created by applying algorithms developed in a previous survey of prisoners [13, 14]. Subjects screening positive for psychotic disorder responded positively to one of: auditory hallucinations; having received a diagnosis of psychosis or psychotic symptoms; receipt of anti-psychotic medication; or having had an in-patient stay in a mental hospital or ward. Fulfilment of any of these criteria and diagnoses from the SCID-II screen determined selection for a second phase interview in which schizophrenia or other non-affective psychotic disorder was assessed using the schedules for Clinical Assessment in Neuropsychiatry (SCAN) [15] personality disorder using the SCID-II interview, and psychopathy.

Additional ICD-10 clinical syndromes were measured using self-report instruments in Phase I. Affective and anxiety disorders in the week preceding interview were assessed using the revised version of the Clinical Interview Schedule (CIS-R) [16]. Data are presented on the prevalence of six ICD-10 syndromes: mixed anxiety and depressive disorder, generalised anxiety disorder, depressive episode, all phobias, obsessive–compulsive disorder, and panic disorder. Alcohol misuse was measured using the Alcohol Use Disorders Identification Test (AUDIT), [17] and alcohol dependence using the Severity Of Alcohol Dependence Questionnaire (SAD-Q) [18]. Questions designed to measure drug use were included for a series of different substances for any of five questions to measure drug use and dependence over the past year [11]. Questions on healthcare service use, criminal justice involvement, and other social and behavioural problems over the lifetime were also included.

Psychopathy was measured using the Screening-Version of the Psychopathy-Checklist Revised (PCL:SV) [19], a shortened 12-item rating scale based directly on the PCL-R. The PCL:SV has good validity and overall agreement between the PCL:SV and PCL-R is very high [20, 21]. Items are rated on a 3-point scale (0 = does not apply, 1 = applies to a certain extent, 2 = applies) and summed to yield total scores ranging from 0 to 24. This represents a dimensional measure of the degree to which a given individual matches the prototypical psychopath. The recommended (standard) procedure is to score the PCL:SV by integrating interview and collateral information.

For diagnostic purposes and using the standard procedure, 18 or greater is used as a cut-off score for probable psychopathy; and scores between 13 and 17 as an indication of possible psychopathy. These cut-off scores were used in the MacArthur Violence Risk Assessment Study, which included samples of civil psychiatric patients and a comparison sample from the community [22, 23]. As in the present study, PCL:SV assessments in the MacArthur study were based on clinical inferences obtained primarily from

interview data. Research with the PCL-R indicates that scores from interview-based assessments are lower than from those that include adequate collateral information [20]. We therefore conducted analyses using cut-off scores of both 13 and 11 for possible psychopathy.

Interviewers in Phase II of the survey were psychology graduates trained by reviewing the research background to psychopathy, the PCL:SV assessment procedure, and scoring using a large group format and involving the viewing of videotapes of assessment interviews to establish norms for scoring individual PCL:SV items. They were supervised throughout the fieldwork period by an experienced field manager to provide quality assurance and standardisation. Alpha coefficients of total, male, and female PCL:SV scores were within the acceptable range (total 0.83, male 0.83, female 0.79) suggesting good internal consistency. Inter-item correlations ( $M = 0.27$ ,  $SD = 0.13$ ,  $MD = 0.25$ , range  $-0.02$ – $0.55$ ), which should range between 0.25 and 0.50, also indicated satisfactory homogeneity.

### Measurement of violent behaviour

All participants were asked questions about violent behaviour in the first phase of the study, in the context of establishing the diagnosis of Antisocial Personality Disorder (ASPD). These included questions from the conduct disorder section, including whether they had started fights and whether they had threatened or hurt anyone with a weapon before the age of 15 years. In addition, they were asked whether they had been in a fight since the age of 15 years, and whether they had used a weapon in a fight. As we intended to retain the diagnostic category of ASPD in subsequent analyses, in contrast to Swanson and colleagues [8] who derived outcome variables of violence from this diagnosis, we included additional questions similar to that used in previous surveys in New York [6] and Israel [7]. Participants were asked: “Have you been in a physical fight, assaulted, or deliberately hit anyone in the past 5 years?”

If people responded positively, additional questions covered location of incidents, victims, and outcome. We defined self-reported violent behaviour as severe if victim or respondent were injured; the behaviour as versatile if three or more different types of victims; and repetitive if the respondent had been involved in five or more violent incidents over the previous 5 years. Additional measures for the situation of violence, including location and intoxication as well as victim type, were constructed. Spouses or cohabiting partners and girlfriends or boyfriends, were combined into a single category of victim in relationship as were child and other family members. Positive acknowledgement of being injured, or seeing a

general practitioner, or attending hospital because of injuries were combined into a single category of respondent injured in an incident in the previous 5 years.

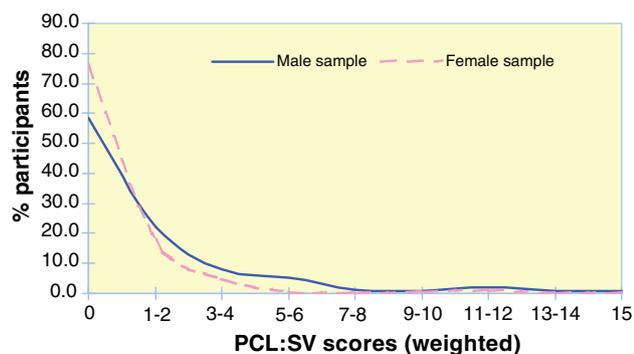
### Statistical analysis

To estimate the prevalence of violent behaviour in the population of Great Britain, weights were used to account for unequal selection of probabilities in the two-phase sample survey. Detailed procedures in constructing weighting variables were given in a previous survey publication [10]. Based on the second phase sample, comparisons between unweighted and weighted prevalence of personality disorders showed considerable differences. Weighted results are a more accurate representation of the general population, and weighted analyses were therefore performed to calculate prevalence of violence and psychiatric diagnosis. The four-factor (or facet) model has demonstrated good fit [24] and was examined for associations with each categorical measure of violent behaviour. The effect of each facet score on violent measures was estimated by logistic regression analysis, adjusting for possible confounding such as demographic variables, Axis I disorders, and the other three facets. The facet scores were log transformed in the regression analysis due to their skewed distribution. Logistic regression analysis was also used to estimate the effects of “probable” psychopathy and other psychiatric diagnoses on violent behaviour in the past 5 years, represented using odds ratios (OR). PAR of probable psychopathy and the other diagnoses were calculated based on their adjusted OR estimate on violence and the weighted prevalence.

All analyses were carried out using SPSS 12.0.

### Results

Unweighted data included 11 (1.8%) participants scoring 11 or more on the PCL:SV, 4 (0.6%) scoring 13 or more, with 1 subject above the recommended cutoff for probable psychopathy of 18 who scored 20. The weighted prevalence of “possible” psychopathy using a cutoff score of 11 points or more in this population was 2.1% (95% CI 1.2–3.8); 3.7% (95% CI 1.8–6.6) in men and 0.9% (95% CI 0.2–2.8) in women. Using a cutoff of 13 or more, the prevalence of probable psychopathy was 0.6, 1.3% (95% CI 0.3–3.4) in men and 0% in women. Figure 1 shows the weighted distribution of PCL:SV scores among men and women, indicating a quasi-continuous distribution of psychopathic traits accounted for by a subgroup of the population with the majority (70.8%) demonstrating no psychopathic traits.



**Fig. 1** Distribution of weighted PCL:SV scores

Table 1 demonstrates the weighted prevalence of self-reported violent behaviour over the lifetime for persons in the household population, with 16% reporting having assaulted someone or being in a fight over the past 5 years. Men were more than 2.5 times more likely to report violence over the past 5 years than women. However, the male to female ratio increased for violence when intoxicated, starting fights before the age of 15 years, using weapons, and any violent behaviour since the age of 15 years.

Figure 2 demonstrates a linear relationship between reporting violence over the past 5 years and PCL:SV scores for women in the general population (no women in the sample scored between 5 and 10 on this instrument). Men demonstrated a differing pattern of association, with a less marked linear increase from zero to scores of 3–4, followed by a dramatic increase in the proportion reporting violence from 5 to 10 onwards, the latter no longer a linear association. However, Fig. 3 demonstrates a different effect of psychopathic traits on repetitive violence in the population, with moderate effects on repetitive violence among women, but with repetitive violence generally at a low level. There seemed an exponential increase in the risk of repetitive violence among men scoring 10 or more on the PCL:SV.

Table 2 demonstrates independent effects of psychiatric morbidity on the prevalence of reported violence over the

past 5 years. Psychopathy defined at cutoffs of both 11 and 13 or more on the PCL:SV were both associated with the highest prevalences of reported violence for any diagnosis, including ASPD. Table 2 also indicates that participants scoring 11 or more on the PCL:SV accounted for 18.7% of all violent incidents over the 5-year period, with a PAR of 16.6%, exceeding the impact on the population made by ASPD. Table 2 demonstrates that other diagnostic categories which increased risk of violence, including hazardous drinking and anxiety/affective disorder, had much higher prevalences. For example, hazardous drinking accounted for 44.7% of all violent incidents and a PAR% of 38.3, but the prevalence in the population was very high. Despite a prevalence of only 0.7%, psychopathy at a cutoff of 13 demonstrated a PAR of 17.5%, corresponding to the high risk of repetitive violence previously demonstrated in Fig. 3.

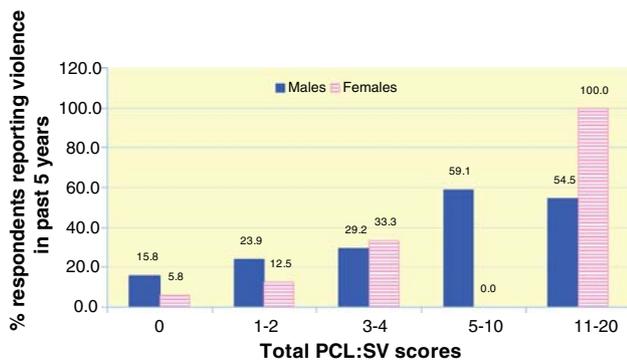
Table 3 demonstrates the effects of psychopathy on measures of severity of violence over the past 5 years, indicating that total PCL:SV scores were associated with increased risk of reporting that a victim was injured and that three or more victim types had been assaulted. However, there were no independent associations between psychopathy and reporting that the perpetrator had been injured, five or more or violent incidents, or violent behaviour whilst intoxicated. Examining independent effects of the four facets of psychopathy indicated that the antisocial items (F4) had primarily contributed to these associations, although the interpersonal facet (F1) had also contributed to the association with three or more victim types.

Table 4 demonstrates independent associations between total PCL:SV scores and victims of violence who were in a relationship with the respondent, friends, persons known to them, or strangers. Examining independent contributions of the four facets indicated that items in the interpersonal facet (F1) contributed to violence towards persons known to the respondent. The affective facet (F2) contributed towards violence towards strangers, but with a negative association with violence towards persons known to them.

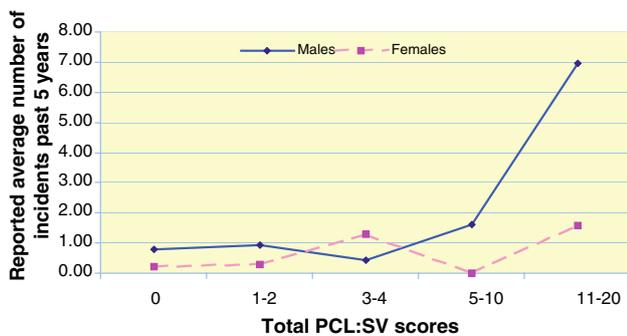
**Table 1** Weighted prevalence of self-reported violent behaviour for persons 16–74 years

Self-reported violence	Men ( <i>n</i> = 301)		Women ( <i>n</i> = 319)		All respondents ( <i>n</i> = 620)	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Violence past 5 years	71	23.6	28	8.8	99	16.0
Violence when intoxicated past 5 years	38	12.6	10	3.1	48	7.7
Started fights before 15 years	39	13.0	11	3.4	50	8.1
Used weapon before 15 years	29	9.6	7	2.2	36	5.8
Been in fights since 15 years	168	56.0	51	16.0	219	35.3
Used weapon in a fight since 15 years	21	7.0	5	1.6	26	4.2

*N* weighted number of respondents



**Fig. 2** Prevalence of reported violence by sex according to PCL:SV scores



**Fig. 3** Number of incidents in past 5 years and psychopathy among individuals who reported violence (*n* = 98)

The lifestyle facet (F3) did not make any contribution to choice of victim and demonstrated a negative association with violence towards strangers. The antisocial facet (F4) demonstrated strongest statistical associations among the four facets with choice of victims, (except the association

with strangers) and demonstrated independent associations with victims in a relationship with the respondent, family members, friends, persons known, and strangers.

Table 5 demonstrates effects of PCL:SV items on reported location of violent incidents, demonstrating independent associations between total scores and violence in the street/outdoors, bars, workplace, and other locations, but not in the respondent’s or another person’s home. The interpersonal (F1) and lifestyle (F3) facets made no independent contribution to location. However, the affective facet (F2) was independently associated with violence in bars, and the antisocial facet (F4) with violence in the street or outdoors.

## Discussion

### Public health implications

This study is the first to examine the public health implications of associations between violence and psychopathy in a representative community sample. It confirms that psychopathy conveys the highest risk of all psychiatric diagnoses. This conforms to popular notions of risks posed by these individuals [1]. More importantly, however, psychopathy (defined using cut-offs) makes a substantial contribution to the overall level of violence in the population despite being a rare condition. An alternative, public health conceptualisation, indicated by the population-attributable risk (PAR) percent, is that effective treatment interventions, or by otherwise eradicating psychopathy from the population, would have a substantial effect on the level of violence in the population (18.7% of all incidents

**Table 2** Weighted prevalence of respondents reporting violent behaviour in last 5 years by categories of diagnoses, and adjusted odds ratio from logistic regression analysis

Diagnostic group	Weighted		% Violent	Adjusted OR	95% CI	PAR %	% Incidents
	<i>N</i>	%					
No disorder (reference)	366	58.7	17.1	1.00	–	–	36.2
Affective/anxiety disorder (CIS-R)	108	17.3	13.0	2.42	1.15, 5.11	15.6	28.1
ASPD (SCID-II interview)	4	0.6	50.0	9.02	0.90, 89.9	4.6	4.1
Any PD (SCID-II interview)	31	5.0	12.9	2.40	0.64, 8.83	10.7	7.1
Schizophrenia (SCAN interview)	6	1.0	0.0	1.16	0.03, 42.2	0.16	1.0
Hazardous drinking (AUDIT 8+)	183	29.3	22.0	3.65	1.81, 7.35	43.7	57.4
Alcohol dependent	51	8.2	23.5	2.39	1.03, 5.52	10.2	16.8
Drug dependence	25	4.0	24.0	1.55	0.54, 4.44	2.2	14.2
Probable psychopathy (11+)	13	2.1	61.5	10.5	2.86, 38.2	16.6	18.7
Probable psychopathy (13+)	5	0.7	80.0	31.2	1.63, 597.8	17.5	13.9

Adjustments included age and sex. Each group was compared with the group of no disorder that was exclusive of any neurotic disorder, any PD, psychosis screen positive, alcohol and drug dependence

PAR population-attributable risk

**Table 3** Effects of psychopathy on various measures of violence in past 5 years from logistic regression analysis

Measurement of severity of violence ( <i>n</i> )	Total PCL:SV		Facet 1		Facet 2		Facet 3		Facet 4	
	Mean (SD)	$\beta$	Mean (SD)	$\beta$	Mean (SD)	$\beta$	Mean (SD)	$\beta$	Mean (SD)	$\beta$
Victim injured (39)	3.09 (4.20)	0.71**	0.44 (1.10)	-0.27	0.62 (1.28)	-0.11	0.42 (1.06)	-0.76	1.62 (2.00)	1.49***
Perpetrator injured (35)	2.57 (4.07)	0.27	0.22 (0.70)	-0.70	0.63 (1.30)	0.25	0.59 (1.15)	0.03	1.14 (1.76)	0.57
Five or more violent incidents (28)	3.23 (4.84)	0.23	0.51 (1.24)	0.17	0.68 (1.36)	0.17	0.66 (1.37)	-0.07	1.38 (2.12)	0.34
Three or more victim types (30)	3.22 (4.35)	0.79***	0.82 (1.33)	0.99**	0.68 (1.34)	-0.23	0.40 (1.01)	-0.53	1.31 (1.63)	1.12***
Violent when intoxicated (50)	3.46 (4.67)	-0.18	0.42 (1.07)	0.28	0.90 (1.53)	-0.53	0.55 (1.24)	0.26	1.59 (2.01)	-0.30

Adjustments: sex, age, social class III–V, single, alcohol dependence, drug dependence, and other factors in 4-facet model. Adjustments for violent when intoxicated; omit alcohol and drug dependence

\*\*  $p \leq 0.01$ ; \*\*\*  $p \leq 0.001$

**Table 4** Effects of psychopathy on victim subtypes involved in violent incidents in past 5 years from logistic regression analysis

Victim of violence ( <i>n</i> )	Total PCL:SV		Facet 1		Facet 2		Facet 3		Facet 4	
	Mean (SD)	$\beta$	Mean (SD)	$\beta$	Mean (SD)	$\beta$	Mean (SD)	$\beta$	Mean (SD)	$\beta$
Relationship/partner (20)	2.15 (3.11)	0.57*	0.27 (0.59)	-0.03	0.47 (1.13)	0.29	0.45 (1.00)	-0.53	0.97 (1.57)	0.85*
Family member (9)	2.01 (2.29)	0.32	0.30 (0.75)	-0.39	0.27 (0.73)	-0.53	0.42 (1.11)	-1.46	1.11 (1.37)	1.41**
Friend (26)	2.27 (2.22)	0.67**	0.26 (0.69)	-0.07	0.32 (0.75)	-0.85	0.60 (0.89)	0.45	1.09 (1.03)	1.34***
Person known (27)	4.72 (5.11)	1.00***	0.85 (1.33)	0.73*	0.73 (1.43)	-0.80*	0.88 (1.54)	0.10	2.25 (2.17)	1.63***
Stranger (48)	2.91 (4.02)	0.59***	0.56 (1.09)	0.34	0.93 (1.49)	1.17***	0.25 (0.79)	-1.48**	1.18 (1.69)	0.68*
Police (7)	4.12 (4.61)	0.48	0.86 (1.35)	0.48	0.87 (1.58)	-0.04	0.82 (1.77)	0.08	1.58 (2.09)	0.60
Other (11)	3.56 (2.76)	0.30	1.12 (1.78)	0.65	1.00 (1.82)	0.11	0 (0)	-	1.43 (2.24)	0.61

Adjustments: sex, age, social class III–V, single, alcohol dependence, drug dependence, and other factors in 4-facet model

\*  $p \leq 0.05$ ; \*\*  $p \leq 0.01$ ; \*\*\*  $p \leq 0.001$

**Table 5** Effects of psychopathy on location of violence from logistic regression analysis

Location of violence ( <i>n</i> )	Total PCL:SV		Facet 1		Facet 2		Facet 3		Facet 4	
	Mean (SD)	$\beta$	Mean (SD)	$\beta$	Mean (SD)	$\beta$	Mean (SD)	$\beta$	Mean (SD)	$\beta$
Perpetrator's home (18)	1.82 (2.27)	0.34	0.29 (0.67)	0.08	0.41 (0.91)	0.47	0.48 (1.03)	-0.23	0.63 (1.13)	0.17
Other's home (9)	2.94 (5.02)	0.44	0.60 (1.07)	0.91	0.21 (0.95)	-1.66	0.81 (1.76)	-0.03	1.32 (1.71)	0.87
Street/outdoors (69)	2.99 (3.83)	0.87***	0.41 (0.93)	-0.13	0.71 (1.34)	0.36	0.48 (1.06)	-0.59	1.39 (1.74)	1.38***
Bar (35)	3.65 (4.67)	0.54**	0.46 (1.15)	-0.27	1.00 (1.53)	0.85**	0.58 (1.10)	-0.21	1.61 (2.19)	0.53
Workplace (8)	5.61 (5.77)	0.86**	1.67 (1.86)	1.25	1.53 (1.91)	1.47	0 (0)	-	2.42 (2.37)	0.71
Other (14)	5.40 (6.00)	0.94**	1.21 (1.61)	0.57	1.19 (1.73)	0.21	0.88 (1.58)	0.22	2.31 (2.64)	0.90

Adjustments: sex, age, social class III–V, single, alcohol dependence, drug dependence, and other factors in 4-facet model

\*  $p \leq 0.05$ ; \*\*  $p \leq 0.01$ ; \*\*\*  $p \leq 0.001$

at PCL:SV 11+) and consequent burden of care on healthcare and criminal justice agencies. Reducing problematic alcohol consumption, which is high in the UK population, could have an even greater impact. However, this would require very different population preventive interventions [25]. In contrast, targeted interventions would be required for this small group of very high-risk, psychopathic individuals [26, 27].

In contrast to a household population, psychopathic individuals (defined by a cutoff) are highly prevalent

among prisoners and make a significant contribution to criminal violence and violence in correctional settings [1, 28]. By demonstrating a substantial contribution to violence at the population level, far greater than expected on the basis of prevalence, our study indicates that the public health impact of psychopathy should now be reconsidered. This contrasts with the impact made by major psychosis [9]. Despite considerable public concern in many countries over risks from psychotic persons, and contrasting with psychopaths, their absolute risk at the population

level is very small [4, 29]. Furthermore, although many psychopaths spend long and repeated periods in correctional facilities this is no cause for reassurance. If the sizes of the prison and household populations in the UK are compared, it is apparent that the majority of psychopaths at any one time are in the community.

### Violence and the four facets of psychopathy

Following adjustments for confounding from other facets, certain associations expected from previous research disappeared in this population sample. Psychopathic traits were generally associated with victim injury during violent altercations and three or more victim types. These effects on severity were primarily due to the antisocial (Facet 4) component of the psychopathy construct, with some additional effects from interpersonal (F1) items on multiple victim types. The latter were probably mediated through arrogant and manipulative personality characteristics of these individuals, leading to interpersonal difficulties with persons in relationships, as well as strangers, and other persons. However, lack of associations between lifestyle (Facet 3) items, including irresponsibility and impulsivity, were unexpected. Their absence was nevertheless consistent in not having any effects on victim subtypes or location of violence in this study. These findings do not support the notion that violent behaviour associated with psychopathy is truly impulsive, independent of antisocial (Facet 4) items. This may represent a true absence of an association with impulsivity. However, it could also reflect multicollinearity between F3 and F4 items, which are demonstrated to be highly correlated [4]. Despite earlier findings in criminal samples that psychopaths often engage in reactive violence defined as unplanned and immediately precipitated by provocative stimuli [30, 31], an influential study of male homicide offenders demonstrated that homicides committed by psychopaths were more likely to have been instrumental, with external incentives such as financial gain, drugs, or sex [2]. A “selective impulsivity” explanation was suggested in which psychopaths’ impulsive aggression in violent contexts may not be as uncontrollable as it appears. Instead, it may reflect a choice not to inhibit such behaviour when the perceived stakes are lower and that they are therefore more likely to plan and execute an instrumental homicide.

Findings that Facet 4 (antisocial) played a major part in severity of violence, choice of victim, and likelihood that violence occurred in the street or outdoors correspond to findings in a previous study of associations between violence and antisocial personality disorder [3]. Items of adolescent and adult antisocial behaviour and poor behavioural controls are relatively uncommon in a household sample, contrasting with forensic samples where

statistical associations with the antisocial facet are more likely to be obscured. It is possible that violence located in the street and outdoors reflected the antisocial lifestyle of a significant proportion of violent individuals. Multiple victim types may have also reflected this lifestyle, together with a tendency to difficult interpersonal relationships due to superficiality, grandiosity, and deceitfulness.

Lack of specific associations between violence when intoxicated and psychopathic traits were unsurprising in a population with overall high levels of hazardous drinking and associated violence [3]. In this context, associations between violence involving strangers, taking place in bars, and the affective facet (F2) are important findings. These support the notion that violent behaviour in drinking situations is not exclusively reactive or caused by disinhibition through alcohol intoxication, and that social effects of the drinking context [32] can be mediated through personality factors characterised by lack of affective response, fearlessness, or even thrill seeking when engaging in violent altercations with total strangers in a bar. The fighting skills of the other person will be unknown and final outcome uncertain. Alcohol intoxication alone might lead to foolhardiness and lack of judgement in many individuals engaging in such encounters. But for individuals with psychopathic traits, this is facilitated by low fear associated with deficit in an anxiety system that inhibits behaviour, correlating with high scores on Facet 2 measuring affective deficiency [33]. Current research has not yet identified whether harm avoidance relates to fear or anxiety [34]. However, this deficit in harm avoidance does not appear independently related to impulsivity in Facet 3 according to our study.

### Limitations

Diagnostic categories of affective and anxiety disorders and substance use were derived from self-report measures in the first phase of the study and not measured in the second, which may have resulted in false-positives. Dating of episodes of mental disorder was also problematic, as the survey did not examine specifically whether violent incidents were related to time periods when symptoms were present. Furthermore, our measures of violence did not include objective information such as arrests or convictions for violence to support self-reported data.

Associations observed with severity, victim, and location of violence were with psychopathic traits in this study and not with psychopathy as a categorically defined entity. Few participants exceeded the cutoff of 13 on the PCL:SV in the second phase of this survey where the sampling frame had been designed to estimate prevalence of uncommon conditions. This may have been due to reluctance of psychopathic individuals to participate and may

have been a major problem as we were measuring a condition characterised by conning and pathological lying. Future surveys may obtain more extensive collateral information than available to us. Furthermore, subsequent attrition in both phases of the survey may not have been compensated for by the weighting process, and prisoners and homeless persons were not included in this survey.

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