"How to spot a psychopath". Lay theories of psychopathy

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ORIGINAL PAPER

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"How to spot a psychopath"

Lay theories of psychopathy

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Abstract The present study examined lay recognition of psychopathy and beliefs about the behavioural manifestations, aetiology, and treatments of psychopathy. A community sample of 232 participants completed a questionnaire consisting of a vignette-identification task, a ratings task of 45 attitudinal items about psychopathy, and demographics. Analysis of the vignette-identification data showed that participants were significantly less likely to correctly identify a case of psychopathy than they were of either depression or schizophrenia. Factors derived from principal components analysis of the attitudinal items revealed that participants generally believed psychopaths to be intelligent and to have criminal tendencies, and that psychopathy was likely caused by early trauma and stress. Overall, participants may have had monological beliefs about the manifestations, aetiology, and treatments of psychopathy. These results suggest that educational programmes are required to improve mental health literacy in relation to psychopathy among the general public.

Key words psychopathy – mental health literacy – mental disorders – antisocial personality disorder

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Introduction

Lay theories are the informal, common-sense explanations that individuals provide for particular social behaviours or phenomena and that often differ markedly from academic (that is, expert) theories of the same phenomena [25]. In recent years, a great deal of research has focused on lay theories of mental illness [26–29], predicated on the belief that lay individuals' understanding of mental disorders determines, in part at least, whether they hold sympathetic or stigmatising attitudes toward the distressed; whether and how they seek help when they themselves are troubled, and; whether or not they comply with treatment [2, 4, 38, 50, 69].

Interestingly, when researchers have studied 'mental health literacy' (that is, the public's understanding and beliefs of mental illness; [44]), they have found that the public have difficulty identifying and describing major mental disorders [46]. Moreover, various studies have reported that the general public do not share the same opinions as mental health professionals about aspects of mental disorder, such as causes and risk factors, behavioural manifestations, and the effects of treatment [47, 51]. Not surprisingly, therefore, there has been a recent increase in the number of studies examining lay theories of various mental disorders and psychological constructs [28, 39].

A general finding of these studies is that lay expectancy models of the aetiology and cure for various mental illnesses tend to be based on psychological and sociological, rather than biological, factors [26, 30]. For instance, Link et al. [51] showed that participants tended to emphasise stressful circumstances in a person's life as the most likely cause of a certain condition, over factors such as a chemical imbalance in the brain, upbringing, genetic inheritance, or supernatural forces. Other studies have similarly shown that the social environment and life

events are implicated by the general public in the causation of different mental disorders [3].

Psychopathy

Despite this breadth of research, however, no previous work has examined lay theories of psychopathy. This may be partly due to the controversy that has surrounded the concept of psychopathy since it was first introduced into the psychiatric literature by early theorists [41, 49, 65]. Indeed, the nature and aetiology of psychopathy continues to be debated among psychiatrists and psychologists, although most contemporary definitions of psychopathy rely on the work of Cleckley [15] who delineated sixteen criteria for the diagnosis of psychopathy, and Hare [35] who later developed essential checklists for the assessment of psychopathy in adults.

Hare's [35] Revised Psychopathy Checklist currently appears to be the most widely used classification of the disorder [16]. This checklist determines a person's psychopathy based on criteria that include aggressive narcissism (e.g., pathological lying, lack of remorse or guilt, and a lack of empathy), socially deviant lifestyles (e.g., parasitism, impulsivity), criminal versatility, and having many marital relationships. In this sense, psychopathy identifies one form of pathology associated with high levels of anti-social behaviours and specific forms of emotional impairment [9, 58]. It should be noted, however, that this description of psychopathy has not yet been incorporated into the diagnosis of the disorders in DSM-IV that are most closely related to psychopathy, namely anti-social personality disorder and dissocial personality disorder [1, 56].

The aetiology of psychopathy

Debate surrounding definitions notwithstanding, psychopathy appears to be caused either by a fundamental biological cause or a primarily environmental one [9]. The biological explanation is underpinned by the finding that, provided an individual has a genetic predisposition for the emotional dysfunction seen in psychopathy, they will be at greater risk of developing the full disorder. Blair [10, 11] suggests that these genetic anomalies disrupt the functioning of the amygdala and that this, in turn, leads to an impairment in emotional learning. Support for a genetic influence in explaining the prevalence of psychopathy has been reported among children [70] as well as adults [12].

On the other hand, environmental theories of psychopathy emphasise the role of stressors in engendering emotional dysfunction, which in turn helps predict future psychopathy [23, 52, 53, 60]. In an early commentary, for instance, Bowlby [13] identified a connection between anti-social personality and maternal deprivation in the first 5 years of life. Contemporary accounts have similarly highlighted parental alcoholism, inconsistent discipline, and a lack of supervision as potential contributors to emotional dysfunction [22]. Other environmental stressors may include birth complications [60] and birth complications combined with disadvantaged familial environments [43, 59, 61].

Overall, however, it seems likely that both genetic and environmental factors contribute to the development of psychopathy. Indeed, Moffitt [54] has proposed two hypothetical developmental prototypes of psychopathy that account for both biological and environmental. The first, life-course persistent individuals, are believed to have their behavioural origins in neuro-developmental processes, beginning in childhood and worsening thereafter. The second, adolescence-limited offenders, have their behavioural origins in social processes that begin in adolescence and desist in young adulthood. In short, it seems highly likely that many different causal processes are involved in the development of psychopathy—a concept known as 'equifinality' [24]—and, therefore, theoretical models that focus on only one type of causal process could be inadequate to fully explain fully the development of psychopathy.

The treatment of psychopathy

Similar to the diagnosis of the psychopathy, the treatment of the psychopaths has long concerned criminologists and mental health experts and can generally be classified under pharmacological and physical treatments. In terms of pharmacological treatments, common forms of medication used with psychopaths are neuroleptics, lithium, psychostimulants, and anticonvulsants [37, 64]. Neuroleptics, in particular, appear to have a trainquilisng effect on disturbed behaviour [8], while lithium can help reduce impulsivity, explosivity, and emotionally-unstable behaviours.

Pharmacological approaches to psychopathy are usually used in conjunction with some form of psychosocial treatment, such as behavioural therapy, cognitive therapy, or individual and group psychotherapy. In the first instance, a number of behavioural techniques have been developed with specific skills deficits of psychopaths in mind [20]. Such treatments involve the identification of skills deficits and patient engagement in forms of skills training (e.g., anger management, dealing with authority figures), which are then applied to real situations.

Cognitive therapy works on a similar principle, focusing in psychopaths' maladaptive or irrational thoughts, and providing new ways of thinking or behaving [21]. Many cognitive therapies use social imitation as a means of teaching patients how to behave appropriately within different social situations, often in combination with relaxation training [55].

Finally, psychotherapy has also been used to treat psychopaths [19], by helping patients achieve greater self-awareness, self-control, and empathy [8]. Similarly, group psychotherapy may help psychopaths by providing education, encouragement, and support for patients [57].

If, on the other hand, the antisocial behaviour is thought to be a result of some neuropsychological impairment, then physical treatments (e.g., electroconvulsive therapy or psychosurgery) may be used. Gunn and Taylor [33] suggest that electroconvulsive therapy may be beneficial in cases where a patient has comordib severe depression, but in general physical treatments such as these remain controversial and are only used when all other forms of treatment have failed.

The present study

The controversy surrounding the classification of psychopathy appears to have distracted concerted efforts to understand the disorder, particularly from the point of view of the public. The latter dearth of research is important for a number of reasons, including the many social aspects of psychopathy that may impinge on everyday life [34] and possible transitions from non-clinical to clinical states of psychopathy [17]. For instance, recent accounts have discussed the social impact of psychopaths within organisational settings [6, 7] and there are also a large number of studies showing that psychopathic individuals reoffend at higher rates than non-psychopathic individuals [31, 66]. Indeed, the prevalence of the disorder may be higher among selected populations, such as prison inmates [36].

More generally, it has been suggested that there is considerable popular misunderstanding surrounding psychopathic personality, particularly in terms of media portrayals of psychopaths [5]. Higgins [42] further argues that the term 'psychopath' has acquired negative connotations within mental health services, and that this may discourage psychopathic individuals from seeking appropriate treatment. Furthermore, lay perceptions of psychopathy may influence the way in which the general public respond to arguments concerning the civil rights, and the ethical treatment, of patients [32, 62].

In order to overcome this dearth in the literature, we conducted a preliminary investigation of lay understanding, beliefs, and theories of psychopathy. Specifically, we first examined whether psychopathy would be as easily recognised as other mental disorders (depression and schizophrenia) using a vignette-identification methodology. Given the dearth of previous research of lay theories of psychopathy, this part of the study was largely exploratory, although we did expect participants to be better able to identify depression and schizophrenia than psychopathy. In addition, we expected participants with formal education in psychiatry and individuals who know others with psychopathy to be better able to identify the mental disorders in general, and psychopathy in particular.

Second, using a quantitative framework, we sought to examine whether lay theories of the aetiology and treatments of psychopathy could be reduced into interpretable factors. Previous work [26, 30, 67] has shown that quantitative analyses such as this, and in particular data reduction, can potentially uncover internal structures of multi-dimensional data sets that help illuminate lay theories and beliefs. In the present study, we specifically examined three related aspects of attitudinal dispositions of psychopathy, namely behavioural manifestations, aetiology, and treatments of psychopathy.

Method

Participants

A total of 232 participants took part in this study, of whom 145 were women and 87 were men. The age range of participants was between 18 and 82 years (*M* 35.71, SD 15.39). The majority of participants were of European Caucasian descent (73.6%), with the remainder being of Asian descent (16.6%), African Caribbean descent (4.6%), and some other ethnic descent (5.2%). In terms of religion, 48.6% self-reported as Christians, 21.3% as atheists, 11.6% as Muslims, 9.3% as Hindus, and 9.2% as being of some other religious affiliation. Finally, in terms of occupational status, 37.9% were students, 21.0% were professionals, 26.5% were of intermediate occupations, 7.3% were of skilled occupations, 2.1% were of semi-skilled occupations, and the remainder held unskilled occupations.

Materials

Vignette identification. Participants were asked to suggest diagnoses for three different disorders presented in the form of vignettes. One vignette accurately referred to a case of psychopathy, modified from a case study presented by Blair et al. [9]. Two further vignettes accurately referred to cases of depression and schizophrenia, respectively, and were obtained and slightly modified from a study by Jorm et al. [45]. Participants were asked to identify the mental disorder described by each vignette in an open-ended response format (Appendix 1). The order of presentation of each vignettes was randomised and did not affect any of the results. Item responses for the three vignettes were quantified by summing correct responses (range 0–3).[1]

Attitudinal dispositions. Participants were presented with 45 attitudinal statements referring to the behavioural manifestations (16 items), aetiology (18 items), and treatments (11 items) of psychopathy. These statements were derived from a review of the relevant literature and past studies on lay theories of psychiatric disorders [26–30, 67], and was further piloted with ten individuals from diverse backgrounds. These pilot participants were asked to identify additional behavioural manifestations, causes, and treatment that they felt were relevant to psychopathy. In the actual

[1] In coding response for the psychopathy vignette, we sought to use an inclusive scoring technique that included the term 'psychopathy' as well 'anti-social personality disorder' and 'dissocial personality disorder'. In practice, however, all participant who correctly identified this vignette used the term 'psychopathy'.

study, participants were asked to rate the extent to which they agreed with each statement on a Likert-type scale (1 Strongly disagree, 7 Strongly agree).

Demographics. All participants provided their demographic details, consisting of sex, age, ethnicity, religion, and occupational status. In addition, participants were asked to indicate on a binary scale (1 Yes, 2 No) whether they had formally studied psychology, psychiatry, or medicine. They were also asked to state on a binary scale (1 Yes, 2 No) whether they themselves had been diagnosed with a mental disorder and whether they knew anyone else who had been diagnosed with a mental disorder (in both cases, an affirmative response was followed by a request for details of the mental disorder in question). Finally, participants rated their interest in mental disorders on a 7-point scale (1 Not at all interested, 7 Very interested).

Procedure

All participants were recruited opportunistically by the first and second authors. Once ethical approval was obtained, participants were recruited from public places (e.g., a university campus, places of work, railway stations, and through personal contacts). The response rate was 91.0%, with the main reason for declining being a lack of time. Participants who agreed to take part in the study completed the questionnaire in view of the experimenters and returned the questionnaire after completion, which took approximately 20 min. All participants provided informed consent, were assured of their anonymity, and were fully debriefed following completion of the questionnaire. All participants took part on a voluntary basis and were not remunerated for participation.

Statistical analyses

Data were analysed using SPSS version 15.0. Vignette identification accuracy across conditions was analysed using Chi-squared tests. Attitudinal dispositions were analysed using principal components analysis (PCA), the aim of which is to reveal the internal structure of potentially multi-dimensional data in a manner that bests explains the variance in the data [68]. Separate PCAs were conducted for each of the different types of attitudinal statements included in the present study, namely for behavioural manifestations, aetiology, and treatments of psychopathy. Differences in endorsement of various factors was examined using within-subjects analyses of variance (ANOVAs) and *t* tests. Finally, we conducted bivariate correlations between each of the different factor scores to examine inter-factor relationships.

Results

Descriptive statistics

A total of 38.4% of the participants had some formal training in psychology, psychiatry, or medicine. In addition, 13.2% self-reported as having previously been diagnosed with a mental disorder and the majority reported knowing someone who had been diagnosed with a mental disorder. In both cases, the disorders were wide-ranging, but by far the most common diagnosis was depression. Finally, when asked to rate their interest in mental disorders, participants' mean rating was 4.45 (SD 1.81).

Vignette analysis

The mean of correct responses on the vignette-identification part of the study was 2.11 (SD 0.82). The vignette describing a case of depression was accurately identified by 97.2% of participants, whereas the vignette describing a case of schizophrenia was correctly identified by 61.0% of participants. By contrast, only 39.1% of participants correctly identified the psychopathy vignette. A Chi-squared test showed that these percentages represent statistically significant differences, $\chi^2(4) = 287.37$, $P < 0.001$. Previously having formally studied psychology, psychiatry, or medicine was significantly correlated with mean number of correct responses ($r = 0.26$, $P < 0.001$), but no significant correlations emerged with sex, age, occupational status, personal and vicarious exposure to mental disorders, or interest in mental disorders (all *r*s < 0.09, all *P*s > 0.05).

Attitudinal dispositions: behavioural manifestations

To examine the factor structure of the 16 behavioural manifestation items, we carried out a PCA with Promax rotation. The significance of Bartlett's test of sphericity, $\chi^2 = 840.23$, $df = 120$, $P < 0.001$, and the size of the Kaiser–Meyer–Olkin measure of sampling adequacy, KMO = 0.76, revealed that the 16 items had adequate common variance for PCA [68]. Both visual inspection of the Scree Test [14] and maximum criteria for the ratio of differences of successive Eigenvalues [63] was used to identify relevant components, and the communality cut-off point for inclusion of an item was set at 0.40. Results of this analysis revealed the existence of three factors that accounted for 42.3% of the variance.

The first factor contained three items that referred to psychopaths' *intelligence and social skills* (Eigenvalue = 4.68, accounting for 24.6% of the variance). The second factor contained three items referring to the *demographics* of psychopaths (Eigenvalue = 1.87, accounting for 9.8% of the variance). The third factor referred to the *criminality and aggression* of psychopaths and contained four items (Eigenvalue = 1.50, accounting for 7.9% of the variance). Factor loadings for each of these items are reported in Table 1. For each factor, we computed factor scores by taking the mean of responses associated with the factor, and these means are reported in Table 1. Cronbach's α coefficients for were of moderate to high reliability [48].

Finally, we conducted an ANOVA to examine whether there were statistical differences in the endorsement of these three factors. Results showed a significant difference in mean ratings of the three factors, $F(2, 438) = 25.57$, $P < 0.001$, $\eta_p^2 = 0.11$ Tests of simple effects showed that the Intelligence factor was rated more positively than the *demographics* factor, $t(223) = 7.38$, $P < 0.001$, and the *criminality* factor, $t(220) = 3.98$, $P < 0.001$. The *criminality* factor was rated more positively than the *demographics* factor, $t(225) = 2.98$, $P < 0.05$.

Table 1 Means, standard deviations, and factor loadings for the 16 behavioural manifestation items

Factor and items	Eigenvalue	Variance/factor loading	*M* (SD)	Cronbach's alpha
1. *Intelligence and social skills*	4.68	24.6	4.54 (1.45)	0.80
Psychopaths can be very high achievers (i.e. they are able to keep a high powered job)		0.94		
Psychopaths are often highly intelligent		0.77		
Psychopaths are very socially skilled and competent in most social situations		0.62		
2. *Demographics*	1.87	9.8	3.76 (1.40)	0.60
Psychopaths are likely to have a low socio-economic status		0.84		
People with psychopathy are more likely to be men than women		0.57		
Psychopaths cannot really live 'normal' lives		0.57		
3. *Criminality*	1.50	7.9	4.07 (1.30)	0.59
Psychopaths normally commit many crimes		0.84		
Psychopaths cannot really have normal, healthy personal relationships		0.78		
Psychopaths are usually violent and aggressive		0.63		
Criminal behaviour in psychopaths cannot be controlled		0.54		
Non-loading items				
Psychopathy is a display of extreme attention-seeking behaviour				
Psychopaths tend to have multiple personalities				
Psychopaths cannot really adequately control their emotions and actions				
Psychopaths are emotionally impaired				
Psychopaths are more likely to suffer from other mental illnesses				
Psychopaths are often more dangerous to others than to themselves				

Attitudinal dispositions: aetiology

A PCA with the same criteria as above was run with the 18 aetiology items and revealed the existence of three factors. The significance of Bartlett's test of sphericity, $\chi^2 = 1584.14$, $df = 153$, $P < 0.001$, and the size of the Kaiser–Meyer–Olkin measure of sampling adequacy, KMO = 0.87, revealed that the 16 items had adequate common variance for PCA [68]. The first factor, which was named *early trauma and stress*, contained six items, had an eigenvalue of 6.33 and explained 35.1% of the variance. The second factor referred to *genetic, blood, and vicarious explanations* and contained five items (Eigenvalue = 1.82, 10.1% of the variance accounted for. The third factor referred to *brain abnormalities and chemical imbalances* and contained five items (Eigenvalue = 1.40, accounting for 7.8% of the variance).

Cronbach's α coefficients for the three factors generally within Kline's [48] recommended cut-offs. Factor loadings and mean factor scores for each of these items and factors are reported in Table 2. An ANOVA showed a significant difference in the ratings of these three factors, F (2, 444) = 65.62, $P < 0.001$, $\eta_p^2 = 0.23$. Tests of simple effects showed that the *early trauma* factor was rated more positively than the

Table 2 Means, standard deviations, and factor loadings for the 18 aetiology items

Factor and items	Eigenvalue	Variance/factor loading	*M* (SD)	Cronbach's alpha
1. *Early trauma and stress*	6.33	35.1	3.52 (1.43)	0.87
Pychopathy is caused by physical/mental abuse as a child/adolescent.		0.89		
Pychopathy is likely to be caused by childhood emotional trauma.		0.86		
Pychopathy is caused by neglect and abuse from others.		0.85		
Pychopathy is caused by repressed feelings and emotions in the subconscious.		0.55		
Pychopathy is mainly due to extreme stress experienced by the individual.		0.48		
Pychopathy is caused by parents bringing up their children incorrectly.		0.40		
2. *Genetic, blood, and vicarious explanations*	1.82	10.1	2.61 (1.15)	0.76
Blood relatives of psychopaths are likely to have other mental disorders.		0.77		
Psychopaths act the way they do because they want to be different.		0.67		
Psychopathy can be caused by genetic abnormalities.		0.66		
Psychopathy can be caused by being brought up by others with the disorder.		0.54		
Psychopathy can be caused by inheriting the genes of someone with the same disorder.		0.53		
3. *Brain abnormalities and chemical imbalances*	1.40	7.8	3.31 (1.38)	0.65
Psychopathy is mainly due to brain damage.		0.76		
Psychopathy has a purely biological basis (i.e. caused by chemical imbalances in the brain).		0.76		
Psychopathy is mainly due to some specific brain dysfunction.		0.70		
Psychopathy can be brought on by taking drugs.		0.63		
Psychopaths have often experienced complications during their birth.		0.47		
Non-loading items				
Psychopathy is little more than a dramatic or flamboyant personality.				
Psychopathy has no physical basis and is purely psychological.				

Table 3 Means, standard deviations, and factor loadings for the 15 treatment items

Factor and items	Eigenvalue	Variance/factor loading	*M* (SD)	Cronbach's alpha
1. *Treatment*	4.68	24.6	3.44 (1.23)	0.92
Community treatment programmes are useful in helping psychopaths.		0.72		
Psychopaths' behaviour can really be improved by counselling.		0.70		
Providing a warm and loving environment can usually cure psychopathy in anyone.		0.68		
Psychopathy can be successfully treated by Freudian psychoanalysis.		0.67		
Psychological treatments such as cognitive behavioural therapy can treat psychopathy.		0.67		
Reducing stress levels will improve psychopathic behaviour.		0.65		
Psychopathy can be treated with medication (drug treatment).		0.57		
Seeing a clinical psychologist is important for the treatment of psychopathy.		0.50		
A belief in God can help someone overcome psychopathy.		0.48		
Psychopaths can only really be cured by lobotomy (brain surgery).		0.46		
2. *Non-treatment*	2.32	15.5	2.88 (1.81)	–
Psychopaths cannot really be treated successfully.		0.46		

Table 4 Bivariate correlations between the seven extracted factor scores, formal education in psychology, medicine, or psychiatry, interest in mental disorders, age, and employment status

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1. Intelligence and social skills		0.38**	0.15*	0.29**	0.26**	0.31**	0.31**	0.19**	0.12	0.01	0.01
2. Demographics			0.36**	0.45**	0.47**	0.44*	0.38**	0.28**	0.12	−0.06	0.12
3. Criminality				0.21**	0.23**	0.27**	0.13	0.11	0.09	−0.05	0.10
4. Early trauma and stress					0.55**	0.49**	0.62**	0.12	0.12	0.13	0.13
5. Genetic and blood explanations						0.62**	0.64**	0.05	0.13	0.09	0.06
6. Brain abnormalities and chemical imbalances							0.64**	0.19**	0.08	0.02	0.04
7. Treatment								0.24**	0.06	−0.01	0.03
8. Formal education in psychology, medicine, psychiatry									0.20**	0.09	0.39**
9. Interest in mental disorders										0.05	0.37**
10. Age											0.12
11. Employment status											

*$P < 0.05$, **$P < 0.001$

genetic factor, t (224) = 11.00, $P < 0.001$, as well as the *brain abnormalities* factor, t (225) = 2.11, $P < 0.05$. In addition, the latter was rated more positively than the *genetic* factor, t (225) = 9.65, $P < 0.001$.

Attitudinal dispositions: treatments

A PCA with the 11 treatments items revealed the existence of two factors. The significance of Bartlett's test of sphericity, $\chi^2 = 510.50$, $df = 55$, $P < 0.001$, and the size of the Kaiser–Meyer–Olkin measure of sampling adequacy, KMO = 0.77, revealed that the 16 items had adequate common variance for PCA [68]. The first factor included all but one item, and included items referring to both psychosocial and biological *treatments* (Eigenvalue = 4.54, accounting for 30.3% of the variance). A second factor included a single item referring to *non-treatment* and had an eigenvalue of 2.32 (15.5% of the variance accounted for).[2] Because single-item factors are inherently unstable, we omitted this factor from all further analyses. Factor loadings and mean factor scores for each of these items and factors are reported in Table 3. Cronbach's α for the *treatments* factor was very high.

Inter-factor correlations

We conducted bivariate Pearson's correlations between each of the seven extracted factors, formal education in psychology, medicine, or psychiatry, interest in mental disorders, age, and occupational status. As can be seen in Table 4, all factor scores bar one (*criminality* and *treatment*) were significantly correlated with each others. In addition, there were significant correlations between formal education in psychology, psychiatry, and medicine with the factors *intelligence and social skills*, *demographics*, *brain abnormalities and chemical imbalances*, and *treatments*. Formal education in psychology, psychiatry, and medicine was also significantly correlated with interest in mental disorders and occupational status. Finally, interest in mental disorders was significantly correlated with occupational status.

[2]This item also cross-loaded onto the first factor (factor loading = −0.36), but this was under our cut-off criterion of 0.40.

Discussion

To our knowledge, this is the first study to have assessed lay theories and beliefs about psychopathy. The results of our work suggest that the general public have a relatively poor comprehension of psychopathy and that their beliefs about the disorder are highly monological in nature (that is, they stem from core beliefs about psychopathy that inform specific content). In the first instance, the vignette-identification task showed that participants were significantly less likely to correctly identify a case of psychopathy than they were depression or schizophrenia. In general, this is consistent with Link et al.'s [51] finding that depression and schizophrenia were more likely to be correctly identified as mental illnesses than other disorders, such as alcohol and other drug dependence.

It is possible that the general public have a skewed understanding of psychopathy because of the manner in which the disorder is portrayed in popular culture. Indeed, psychopaths appear to be over-represented in popular culture, almost always in guise of serial killers or mass murderers (e.g., the Joker in DC Comic's *Batman*, Patrick Bateman in *American Psycho*, and various *James Bond* villains). It may also be postulated that popular beliefs often confuse psychopathy and psychotic disorders, such as symptoms of schizophrenia, and that media depictions of psychopathy typically contain as much fiction as fact. Thus, it may be the case that lay theories of psychopathy stem from misinformation or confusion, as well as a lack of real information [5].

The finding that formal study of psychology, psychiatry, or medicine was associated with participants' correct identification of vignettes reinforces the view that mental health education improves mental health literacy. In this sense, it may be suggested that the first steps in improving public understanding of psychopathy should include education programmes that replace myths about mental illness with more accurate information [18]. Moreover, such programmes may need to also involve the presentation of accurate media portrayals of psychopaths and psychopathy, which can begin to overturn skewed perceptions of the disorder.

Overall, quantitative analysis of the attitudinal items suggest that individuals have a monological belief system in relation to psychopathy. That is, participants' beliefs about the behavioural manifestations, aetiology, and treatments of psychopathy were all significantly correlated, suggesting the existence of a single overall belief structure that informs specific content. This fits with the above suggestion that lay individuals have a relatively poor understanding of psychopathy, and further suggests that their beliefs are constructed from rudimentary, core attitudinal dispositions. Nevertheless, it was also possible to discern a number of distinct factors in each of the three analysed categories of responses.

First, in terms of the behavioural manifestations of psychopathy, participants generally showed agreement with items that referred to the high intelligence and social skills of psychopaths, as well their criminal tendencies. Perhaps more interesting was the finding that the aetiology of psychopathy factored into three components dealing with early trauma and stress, genetic, blood and vicarious explanations, and brain abnormalities and chemical imbalances. Participants most strongly endorsed the former and were least likely to agree that psychopathy was caused by genetic and blood explanations. In general, this tendency to emphasise environmental factors over biological causes of mental disorder and psychological symptoms is consistent with previous reports [3, 26, 30, 51, 67].

Third, it would appear that participants' beliefs about treatment of psychopathy factors into actual treatment and non-treatment. In terms of the former, participants appeared not to differentiate between psychosocial and biological forms of treatment, and rather viewed any kind of treatment as effectively being the same. This speaks to their relative lack of knowledge about psychopathy, although importantly participants did appear to believe that the disorder was treatable rather than being untreatable. This finding may have implications for help-seeking behaviour in relation to psychopathic symptoms, although there may remain some confusion as to which type of treatment is most effective.

A number of shortcomings limit the results of the present study. First, while we have explained our results as a function of monological core beliefs, it is possible that this specific result was an artefact of the quantitative design. That is to say, quantitative analyses may not be the most appropriate way to understand lay beliefs about relatively poorly understood phenomena. In such cases, explicitly qualitative may prove more satisfactory in uncovering lay beliefs and may also prove useful for grounding future research. Second, our sample should not be considered representative of the wider British public, as our method of sampling likely introduced biases and reduced the likelihood that sampling represented a good cross-section of the population [40]. As such, the present study should be considered a preliminary investigation of lay beliefs about psychopathy, and future studies would do well to introduce more systematic sampling of the general population.

These limitations notwithstanding, the present study suggests that the general public have a relatively poor understanding of psychopathy, at least in relation to other disorders such as depression and schizophrenia. This lack of understanding may both give rise to and surface from a monological belief system that attempts to simplify and make sense of psychopathy and its behavioural manifestations,

aetiology, and treatments. Added to the unrealistic portrayal of psychopaths in popular culture, it would appear that greater education is required to help the general public come to a better understanding of psychopathy. This will be especially important if societies wish to combat poor mental health literacy, improve help-seeking behaviour, and overturn the stigmatisation of mental disorders.

Appendix 1. Vignettes used in the present study

Depression	John has been feeling down recently, and finds it difficult to get out of bed in the morning, even though he has been having difficulty sleeping. He cannot find the energy or motivation to do anything, including going to work or seeing his friends. Even walking around the house feels like an effort. He has lost his appetite and subsequently lost weight. He frequently thinks about death, and sometimes considers committing suicide.
Schizophrenia	Peter spends lots of time alone. He does not react correctly when his family try to talk to him, for example laughing at bad news. He sometimes gets his words mixed up, and his family have heard him talking even when he's alone in his room. Sometimes he will go for hours without moving, even though he's not asleep. He also sometimes experiences auditory hallucinations and delusions.
Psychopathy	Tyler is serving a life sentence for murdering his travelling companion in order to steal his money. He is charming, grandiose, and manipulative. There is overwhelming evidence that Tyler committed the crime for which he is now imprisoned, although he pleaded not guilty in court and showed no remorse or guilt. Despite the prospect of spending the rest of his life in prison and repeatedly being told that an appeal is futile, he remains upbeat, and speaks as though his release is imminent.

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