

Title: Assessing risks of violent extremism in depressive disorders: developing and validating a new measure of Sympathies for Violent Protest and Terrorism (SVPT)

Running head: Assessing risks of violent extremism in depressive disorders

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Abstract

Objective: Clinicians are tasked with assessing the relationship between violence and mental illness.

Yet, there is now a legal expectation in some countries that public services, including health professionals, assess risk of violent extremism – with few available measures. We previously developed a new measure of Sympathies for Radicalisation (SyfoR), using items that measure Sympathies for Violent Protest and Terrorism (SVPT). In this paper we present the detailed psychometric properties of a reduced item measure of SVPT. We use data from two studies to test replication, and then validity against outcomes of self-reported violence and convictions in the entire sample, and in those with depressive symptoms.

Methods: Data from two cross-sectional neighbourhood surveys, consisting of Pakistani and Bangladeshi adults (survey one, n=608), and White British and Pakistani adults (survey two, n=618) were used to undertake confirmatory factor analysis of SyfoR, and produce a short measure of SVPT. Survey two data were used to test the SVPT's convergent validity to classify presence/absence of violence and convictions in the whole sample and for subgroups by depressive disorder.

Results: The seven-item measure's structure was a consistent measure of extremist attitudes across the two surveys. A threshold score of zero to classify violence was optimal (specificity=89.7%; AUC=0.75), but sensitivity to a risk of violence was poor (34.5%). The short version SyfoR was a better classifier of violence in respondents with depression, dysthymia, or both (AUC=0.78), than respondents with neither (AUC=0.69; $\beta=0.62$, 95% CI -0.67 to 1.92; SE=0.66).

Conclusions: The 7 item measure of SVPT is an accessible and valid measure for clinical assessments and helpfully identifies low risk of violence. It enables clinicians to conduct detailed assessments of people endorsing one or more of the items, although further research is needed.

Introduction

In many countries, health professionals and public sector workers are required to report people who express violent extremist attitudes on the grounds that they may be connected with terrorist networks or plotting terrorist acts. However, the evidence to support this interventionist approach is lacking as there are few evidence-based tools to assess risk (Hurlow, Wilson, & James, 2016). Underlying this expectation is a proposed process of ‘radicalisation’ by which an individual becomes increasingly sympathetic towards extremist beliefs and then persuaded to engage in violence. In this model – and consistent with definitions of extremist radicalisation in the USA, Canada, and Europe – extremist attitudes count as proxies for radicalisation. Yet, the notion of radicalisation and its assessment in clinical settings is contested given the limited empirical evidence of causal links between extremist beliefs and violence (Knudsen, 2018). Thus, there is a risk of criminalising marginalised people. The challenge of validating measures of violent extremism is a lack of longitudinal data. Such research is ethically difficult as observations might lead to breaches in confidentiality and incrimination. Furthermore, if people involved in radicalised networks participate in research, they are unlikely to reveal their radical beliefs and intentions. Alternatively, covert methods of gathering data are ethically questionable (Younis & Jadhav, 2019).

A preventive approach to extremism and terrorism is consistent with public health interventions to reduce violent crime, suicide, smoking and a range of other medical conditions (Bhui, Hicks, Lashley, & Jones, 2012; National Academies of Sciences, 2017). Existing assessment tools include the Vulnerability Assessment Framework (VAF) and the Identifying Vulnerable People Guidance (IVPG) (Egan et al., 2016; HM Government, 2012). Both tools were validated in known terrorist offenders; hence, their validity in non-offenders is unknown (Scarcella, Page, & Furtado, 2016). Furthermore, using the VAF or IVPG requires clinical expertise and judgement, and may not be appropriate for use by a broader range of non-specialists, including public and civil servants. Nor can they be self-completed as within a survey or screening questionnaire. These tools do not capture a broad typology of terrorist offences (Lloyd & Dean, 2015), nor are they designed to measure multiple situations and various points in the process between adopting extreme beliefs and acting upon them. The stages that

offer preventive opportunities are i) holding extreme beliefs that sympathise or support violent extremism, and ii) a propensity for violence.

In our previous published research, we developed a measure of extremist beliefs called Sympathies for Radicalisation (SyfoR) (Bhui, Everitt, & Jones, 2014). This was undertaken through stakeholder engagement with community, faith, academic, and charity groups, to identify risky behaviours related to violent extremism (Bhui., Warfa, & Jones, 2014). The SyfoR has high face and content validity (Scarcella et al., 2016). This paper addresses three gaps in the literature: i) testing independent samples to verify the factor structure of the SyfoR, which measures SVPT (i.e. construct validity), and ii) testing whether SVPT are associated with violence in a general population more generally, that is violence unrelated to extremism and terrorism (i.e. convergent validity). We asked about violence in general rather than terrorism-related violence, as respondents are unlikely to incriminate themselves by reporting participation in terrorism and even if they had committed such acts, it is highly unlikely they would answer affirmatively. Furthermore terrorism-related violence is extremely rare in the general population, so asking such questions in a general population survey would deter participation or raise concerns about the intentions of the survey. The ethics committee and our early focus group work in the development of the SyfoR also concluded such questions should not be asked. Finally, iii) given our previous analyses suggested depressive symptoms were associated with SVPT, and the mandate in government policy that health professionals show due regard to assessing extremism, we tested properties of the SyfoR for assessing violence in general in the whole sample and in a subset of people with depressive symptoms.

Method

Design

Data were collected in two surveys in 2011 and 2016 (Bhui et al., 2019; Bhui. et al., 2014). Both surveys comprised of attitudinal and lifestyle questions, along with questions to measure of SVPT. First, we used confirmatory factor analysis (CFA) to test the fit of the latent structure of SyfoR to

produce a short validated measure. CFA was used to produce adjusted and weighted scores showing the contribution of items to an overall score, standardised to the sample population.

Secondly, we tested the convergent validity of short item measure of SVPT to calculate sensitivity, specificity, and predictive values, using receiver operating characteristics (ROC) with an outcome of self-reported violence or convictions. Finally, given the interest in prevention in patients presenting with mood disorders, and findings that depressive disorders are associated with SVPT (Bhui et al., 2019), we tested the convergent validity of our SVPT measure to classify those reporting violence, amongst those with and without depressive disorders.

Participants and sampling

Data collected in 2011 (survey one) included responses from 608 individuals across two localities in England: East London and Bradford. Sampling points were selected from Census data for their high Muslim population density to generate a diverse sample. Participant inclusion criteria were of Pakistani and Bangladeshi heritage, and aged 18-45 years.

Data collected in 2016 (survey two) included responses from 618 individuals, across three localities in England: Blackburn (with Darwen), Bradford, and Luton. Sampling points were those identified as high population density of Pakistani inhabitants. Again, inclusion criteria were those aged 18-45 years, but of Pakistani or White British ethnicity.

In both surveys, respondents were approached via door-knocking in selected communities. Responses were collected using hand-held computers in the presence of a researcher that enabled participants to give confidential responses. Respondents gave informed consent after receiving a complete description of the study, which was recorded electronically. Equal sampling quotas were set for age groups 18-30 years and 31-45 years, gender, ethnicity, and full-time workers versus other employment status. The recruitment and surveys were conducted by Ipsos MORI, a social survey company, and anonymous data with pre-calculated sample weights were provided in the data files. The weight provided by Ipsos MORI was applied in analyses as a population weight to adjust for quota sampling and non-response.

Variables and measurement

Both surveys contained socio-demographic variables, as well as lifestyle and attitudinal items comprising religious attendance, social contact, social capital, political engagement, stressful life experiences, and questions about depression and generalised anxiety (Kroenke, Spitzer, & Williams, 2001; Spitzer, Kroenke, Williams, & Löwe, 2006).

Attitudes towards extremist behaviours were measured using the SyfoR questionnaire of 16 (survey one) or 17 items (survey two) designed using stakeholder engagement with community organisations, and academic and charitable institutions (Bhui. et al., 2014). Attitudes towards these behaviours were measured on a seven-point Likert scale ranging from -3 = “completely condemn” to 3 = “completely sympathise”, and “neutral” responses scored as zero. An expression of “sympathy” was considered an attitudinal risk. Previous analyses of the survey one data found an association between higher SyfoR scores and common mental disorders, criminal history and trauma (Bhui et al., 2019; Bhui, Silva, Topciu, & Jones, 2016). Similar associations were reported in a separate study of individuals with convictions for terror-related offences, (Jensen, 2016) adding to the credibility of SyfoR in measuring a vulnerability to being radicalised (Bhui et al., 2019).

In previous research using data from survey one, a principal components analysis using 16 SyfoR items identified four distinct factors (Bhui. et al., 2014). The first component was a seven-item subset measuring Sympathies for Violent Protest and Terrorism (SVPT); a second component – sympathies for defensive violence; the third – attitudes towards UK foreign policy; and the fourth component – sympathies for fighting against British troops. The four distinct components were replicated in the second survey (Bhui et al., 2019), which included an additional 17th item – the act of fighting against British troops in Syria – that loaded on component four. The seven-item measure of SVPT consisted of the most extreme attitudes related to violence and terrorism, and was found to be consistent between the surveys.

To measure violence propensity, we used the following items: i) one or more convictions for violent offences with or without harm to life or health, or ii) occasional or more frequent fighting and/or

property damage, measured on the Gunn Criminal Profile questionnaire (Gunn & Robertson, 1976).

The comparison group reporting no violence included people with no convictions for violence, and no history of fights or property damage.

We used ICD-10 diagnoses of depression and dysthymia and tested whether the classification properties of our seven-item measure of SVPT in the entire sample also held for people with these depressive disorder diagnoses. Testing the role of depressive disorder on the classification of violence using our seven-item measure of SVPT was in accord with the findings of a previous study showing associations of SVPT with ICD-10 diagnoses of dysthymia, and/or moderate to severe depression (binary measure versus those with neither).

Diagnostic criteria were generated using algorithms reported in analyses of survey two, using the Clinical Interview Schedule Revised (CIS-R, Das-Munshi, Castro-Costa, Dewey, Nazroo, & Prince, 2014) and additional items for dysthymia. An indication of depression required at least one symptom of persistent sadness/low mood, loss of interest/pleasure, or fatigue/low energy, as well as problems with sleep, concentration, confidence, appetite, suicidality, agitation, or guilt/self-blame. An indication of dysthymia required two or more depressive symptoms that occurred most of the day, most days, for two years or more (World Health Organisation, 1992).

Statistical methods

Analysis proceeded in three stages: first, multiple imputation of missing values; second, CFA to test construct validity of the short item measure of SVPT; and third, a test of the convergent validity of the short item measure of SVPT in classifying violence propensity in the overall sample, with and without depressive disorder.

Imputation and missing data: We were able to score 122 of 137 respondents with missing data on depressive disorder using consensus ratings by two, and if necessary three, clinicians who had access to all the information collected. Using this procedure, 89% of the missing diagnostic data were scored. Multiple imputation of further missing data is outlined in the statistical annex.

Confirmatory Factor Analysis: CFA was undertaken using data from both surveys to derive a valid structure for a measure of SVPT. SVPT scores were calculated as the sum of weighted item scores. The item weights were calculated as the item's contribution to the overall latent variable, measured as the proportion of each factor loading to the sum of all factor loadings in CFA. These standardised proportional weights are presented in Table 1. Sensitivity analyses were run using complete cases only and imputed data for each model. More detail on the methods used in multiple imputation and CFA is provided in the supplementary file.

Testing classification against violence: The validated seven-item measure of SVPT and the new scoring method were used in subsequent analyses to classify violence propensity. Associations between SVPT and violence were tested using logistic regressions, both unadjusted and adjusted for ethnicity, gender, age, and marital status. The classification of violence was then tested to produce sensitivity, specificity and prediction at thresholds in the SVPT scores. Likelihood ratios (LR) are provided as the nonparametric alternative to predictive values, with a binary outcome. ROC regression analyses were used to test the covariate role of depressive disorders on the classification of violence propensity using an optimal threshold for SVPT, when adjusted for age, gender, ethnicity and marital status. All analyses were conducted in Stata version 13.1 for Windows, and weighted using the population weight as provided by Ipsos MORI who conducted the surveys.

Results

Factor structure of the measure of SVPT

Using CFA, the seven-item measure of SVPT produced an acceptable model fit and high internal consistency. The structure of the short measure of SVPT is shown in Figure 1, and the proportional weights for scoring the final seven-item measure are presented in Table 1, with a scoring manual in the supplementary materials.

Testing associations between SVPT and violence propensity

Significant univariate risk factors of violence propensity were a higher SVPT score (OR=1.44, 95% CI: 1.1 to 1.83; $P=.004$), being male (OR=2.65, 95% CI 1.02 to 6.89; $P=.045$), being aged 18-30 years (compared to 31-45 years; OR=4.25, 95% CI 1.27 to 16.09; $P=.02$), and being single (OR=3.1, 95% CI 1.09 to 8.89; $P=.03$). In the multivariable model including sociodemographic variables, the weighted SVPT score was associated with higher risk of violence propensity, when adjusted for age, gender, ethnicity, and marital status (OR=1.33 (CI 1.05 to 1.68; $P=0.02$; $n=523$). There were similar findings for complete cases in sensitivity analyses. Adjusted and unadjusted associations are shown in supplementary Table e2.

Classifying violence propensity using SVPT

The unadjusted sensitivity, specificity, and predictive validities of the seven-item measure of SVPT in classifying people reporting and not reporting violence are presented in Table 2. The threshold SVPT score of more than or equal to -2.5 had the best trade off in sensitivity and specificity and the maximum correctly classified people (specificity=68.4%, sensitivity=62.1%; correctly classifying 68%). However, a score of zero or more had a specificity of 89.7%, indicating a better classification of true negatives. Thus, zero is arguably a more valid and practical threshold score to improve the correct rejection of people unlikely to be at risk of violence.

The overall convergent validity of the short measure of SVPT in classifying violence was fair (area under curve (AUC) =0.75, 95% CI 0.56 to 0.79) when adjusted for age, gender, ethnicity and marital status. The short measure of SVPT was a better classifier of violence propensity in those with depression, dysthymia or both (AUC=0.78, 95% CI 0.58 to 0.98), compared to those without (AUC=0.69, 95% CI 0.56, 0.82; $\beta=0.62$, 95% CI -0.67 to 1.92; SE=0.66). In the presence of dysthymia or depression, a high classification of true negatives of non-violence was achieved with a lower threshold score of -0.42 (specificity=94.4%). A sensitivity-specificity plot classifying violence by presence of depression and dysthymia or their absence is displayed in Figure 2, adjusted for marital status, age, gender and ethnicity. Sensitivity analyses using complete cases only were consistent with results from imputed data.

Discussion

Guidance for countering violent extremism often identifies risk as: changes in appearance and behaviours, strongly expressed ideological opinion, or condoning harm, hate, and violence towards others or groups (Home Office, 2015). However, these factors lack specificity, and attempts to translate these behavioural indicators into practice has received criticism for stereotyping and scapegoating marginalised individuals (Weine, Eisenman, Kinsler, Glik, & Polutnik, 2017).

Attempting to predict whether an individual who holds extreme attitudes will then perform criminal acts is challenging. Arguably, a more appropriate and evidence-based approach is required (Bhui et al., 2012). The short measure of SVPT provides a practical option as an early-stage assessment to screen out those with low risk, and recommend more detailed judgements for those scoring high.

The seven-item measure of SVPT can support clinical assessment of individuals thought to be at risk of violent extremism, especially those presenting with depressive symptoms. This is an important finding as previous research shows relationships between violent offending and terrorism with depressive symptoms. A threshold score of zero had a specificity of 89%, i.e. a low probability of false positives – being important for screening purposes for the rare phenomenon of violent extremism. A higher score is associated with a greater propensity to violence, and can be used qualitatively to guide more detailed clinical assessment. Our measure of SVPT is a marginally better classifier of violence propensity in those with depression, dysthymia or both, compared to those with neither, suggesting a useful role in assessing people with mood disorders who hold extremist beliefs or have a history of violence. We are further testing the measure in forensic populations.

The findings support the more general body of research that risk prediction of violence using structured measures is poor (Coid, Ullrich, & Kallis, 2013). Individual assessments incorporating our measure of SVPT should use additional assessment tools. Additional evidence of cognitive and affective risk factors are important for assessment of vulnerability to engaging in violent extremism, including a heightened sense of injustice; intolerance of alternative beliefs; attempted abolition of

perceived threats; paranoia, rage, or suspiciousness; and self-righteousness (Altemeyer & Altemeyer, 1996; Berlet, 2004; Boyd, 2010; De Regt, Smits, & Mortelmans, 2011; Hetherington & Suhay, 2011; Jost, Glaser, Kruglanski, & Sulloway, 2003; Rogers et al., 2007; Rokeach, 1954; Seipel, Rippl, Kindervater, & Lederer, 2012; Strozier & Boyd, 2010); distress, trauma, and social disconnectedness (Bhui et al., 2014; Bhui, Silva, et al., 2016; CPRLV, 2018); as well as mental disorders including depression, dysthymia, post-traumatic stress disorder (PTSD), and anxiety (Bhui, James, & Wessely, 2016; Bhui et al., 2019; Bhui. et al., 2014; Borum, 2014; Corner & Gill, 2015; Jensen, 2016; Victoroff, 2005), and should also consider a person's political and societal context (Knudsen, 2018).

The strengths of the SyfoR are that it was developed through community engagement, supported by cognitive debriefs in pilot studies before the surveys were undertaken, resulting in higher content validity and normative acceptability (Bhui. et al., 2014; Scarcella et al., 2016). Psychometrically, the short version of the SyfoR holds a consistent factor structure across ethnically and geographically diverse populations, improving its potential generalisability. A systematic review of risk-assessments of radicalisation reported that only the IVPG tool out of 30 assessed tools had published positive and negative predictive values in classifying terrorism offences, together with sensitivity and specificity to risk (Scarcella et al., 2016). The IVPG is a risk-criterion used in professional settings and was validated using a sample of 157 offenders with terror-related convictions (Egan et al., 2016). Thus, its use is restricted to those with a history of convictions for violent extremism offending and deemed unsuitable in a community and non-criminal setting (Egan et al., 2016). Whereas the short measure of SVPT is suitable for community populations, it has similar predictive value to the IVPG. The short measure of SVPT had a 'fair' accuracy for classifying violence ($AUC=0.75$), similar to fair accuracy of the IVPG in classifying violent outcomes in "Islamists, Irish Republicans, and right-wing extremists collectively" ($AUC=0.73$). The short measure of SVPT is the first risk measure of violent extremism for preventive use in non-offenders, however, we did not validate it against actual terrorist incident, given their rarity; rather we used self-reported violence to show that the attitudinal measure does associated with criminality and violent behaviours more generally.

More empirical work is needed to ensure policy and practice is evidence based. Measures of extremism risk should be applied with careful judgement around ethics, given the invariably poor psychometric properties of most available risk assessments of violence in presence of mental disorder (Coid et al., 2013), and in predicting violence longer term (Ramesh, Igoumenou, Vazquez Montes, & Fazel, 2018).

Future Research

Future work should seek to validate the SVPT's sensitivity to changes in risk, test-retest consistency, and prevalence of SVPT in specific populations with mental illness, criminality or both (Scarcella et al., 2016). For example, it is possible that those with historical violent offences are more likely to adopt extremism beliefs, and both lead to depressive symptoms; or that depressive symptoms make the adoption of violence and extremism more likely, although at face value many people with mental illnesses are not violent nor participating in terrorism; thus the additional risk factors that make some people with depressive symptoms hold more SVPT need investigation. This might be done by research to establish the sequence of developing depressive symptoms, violent offending and SVPT. Further validation of the measure comparing terrorist and other violent offenders may also be useful, although challenging in terms of the sample sizes needed and the relatively few people convicted of terrorist violence. Assessing people showing violent behaviours or criminality for SVPT also has practical value for clinicians to be alert to susceptibility to radicalising influences. The short SyfoR is available for further empirical research and we offer a scoring mechanism, yet research needs careful balance of the ethical dilemmas we have discussed above. It is important not to add inadvertently to stigma and fears of people with depressive symptoms or mental illnesses.

Declaration of Interest: All authors report no conflicts of interest or financial relationships with commercial interests, except Professor Bhui who is undertaking a separate project for CPNI examining the role of culture in mental health assessments, as a general learning set for practitioners.

Ethical Standards: The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and

with the Helsinki Declaration of 1975, as revised in 2008. All procedures involving human participants were approved by Queen Mary University of London Research Ethics Committee: QMERC2015/06.

Availability of data and materials: The authors had full access to the anonymised dataset compiled by Ipsos MORI. The dataset generated and/or analysed during the current study are not publicly available as it contains ethically sensitive information, and we are developing further analytic methods, but we are happy to collaborate with groups on reasonable requests. Regrettably due to the sensitivity and care needed in managing and interpreting the analyses, we feel this is a responsible position and supported by our ethics review.

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Tables

Table 1: Proportional weights for scoring the SVPT; derived from CFA in merged survey one and two data

SVPT item [Question: to what extent do you condemn or sympathise with the following actions?]	Scoring weight
1. Commit <u>minor crime</u> in political protests	0.10
2. Use <u>violence</u> in political protests	0.14
3. <u>Threaten</u> to commit terrorist actions as a form of political protest	0.17
4. <u>Organise</u> radical terrorist groups but do not personally participate in protests or violence	0.16
5. Commit terrorist <u>actions</u> as form of political protest	0.17
6. The use of <u>bombs</u> to fight against injustices	0.14
7. The use of <u>suicide</u> bombs to fight against injustices	0.14

Table 2: Sensitivity, specificity and likelihood ratio (LR) of violence at SVPT thresholds; unadjusted; survey two imputed data

7-item SVPT (AUC = 0.68; 95%CI: 0.56-0.79)					
SVPT cut-point	Sensitivity	Specificity	Correctly classified	LR+	LR-
-2.89	72.86%	48.83%	50.09%	1.42	0.57
-2.51	62.07%	68.36%	68.02%	1.96	0.55
-2.02	51.72%	77.15%	75.79%	2.26	0.63
-1.01	41.38%	83.01%	80.78%	2.44	0.71
0	34.48%	89.65%	86.69%	3.33	0.73
1.21	34.48%	99.41%	95.93%	58.85	0.66
7-item SVPT for those with depression and/or dysthymia (AUC = 0.78; 95%CI: 0.58, 0.98)					
SVPT cut-point	Sensitivity	Specificity	Correctly classified	LR+	LR-
-2.73	100%	38.89%	45.00%	1.64	0.00
-2.53	100%	50.00%	55.00%	2.00	0.00
-2.02	100%	72.22%	75.00%	3.60	0.00
-1.83	100%	77.78%	80.00%	4.50	0.00
-1.74	50.00%	77.78%	75.00%	2.25	0.64
-0.42	0.00%	94.44%	85.00%	0.00	1.06
7-item SVPT for those without depression and/or dysthymia (AUC = 0.69; 95%CI: 0.56, 0.82)					
SVPT cut-point	Sensitivity	Specificity	Correctly classified	LR+	LR-
-2.89	70.83%	48.04%	49.31%	1.36	0.61
-2.51	62.50%	68.38%	68.06%	1.98	0.55
-2.02	50.00%	77.21%	75.69%	2.19	0.65
-1.01	50.00%	82.35%	80.56%	2.83	0.61
0	41.67%	88.73%	86.11%	3.70	0.66
1.21	41.67%	99.51%	96.30%	85.00	0.59
AUC: area under curve; LR: likelihood ratio for a positive or negative test (i.e. the probability of the outcome occurring in those above the threshold score by the probability in those below the score)					